Diamond Jubilee Convocation

DUQUESNE UNIVERSITY
NOVEMBER 11-12, 1953

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Very Reverend Francis H. McGlynn

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Diamond Jubilee Convocation

1878

DUQUESNE UNIVERSITY
NOVEMBER 11-12, 1953

SEGRETERIA DI STATO
DI
SUA SANTITA

VATICAN CITY

Reverend and dear Father,

It is with deep pleasure that I convey to you the paternal greetings of His Holiness on the occasion of the Diamond Jubilee of Duquesne University.

As you look back over the work of your beloved University during the past seventy-five years, you cannot but raise your hearts to God in fervent thanksgiving. From the humble beginnings of three quarters of a century ago, the University has continued to progress and develop to the present day, and its sound teaching has had a noteworthy effect on the vitality of the Catholic Church in your great country.

The Holy Father expresses His cordial felicitations on those admirable achievements, and He renders heartfelt thanks to Divine Providence for the many favors bestowed upon Duquesne during these years. And, in the present circumstances, when there is greater need than ever before of a Catholic laity well instructed in religion and of professional men and women well versed in the principles of Christian ethics, He would have me exhort you to carry on with renewed and even greater vigour the praiseworthy work of which your University may feel justly proud. He prays that with the abiding blessing of Almighty God Duquesne University may continue to be an ever more valuable bulwark to the Catholic Church in the United States of America, and in pledge of that divine favor He cordially imparts His paternal Apostolic Benediction to you, to the Fathers of the Holy Ghost Congregation, to their associates of the laity, to the members of the student body, to the alumni and to all the friends of the University who join in the celebration of this memorable anniversary.

Gladly availing myself of this occasion to assure you of my high esteem and cordial regard, I remain,

Yours sincerely in Christ,

GB Montini
Subst.

Reverend Vernon F. Gallagher, C.S.Sp.,
President, Duquesne University,
Pittsburgh, Pennsylvania

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FOREWORD

It is indeed a pleasure for me to add a few words of introduction to this collection of the inspiring addresses given during our Diamond Jubilee Convocation.

The timely messages brought to us in our hour of celebration by His Eminence, Francis Cardinal Spellman, Archbishop of New York, by the Honorable James A. Farley, and by His Excellency, M. Henri Bonnet, Ambassador from the French Republic, have been the cause of much joy and pleasure.

The theme of our Convocation Symposium, "Philosophy and Science in an Age of Power," presents for consideration the prime problem of all men and of all nations in our day. The vast strides made by scientists, especially in the field of nuclear physics, demand that man season knowledge with reason, temper skills with concern for human welfare. The thoughts of the distinguished members of our Symposium remain as striking, as illuminating and as fresh in print as they were in oral delivery.

Duquesne University looks back upon seventy-five years of dedicated service in the cause of God and country. With courage nurtured in achievement and strengthened by the interest and support of so many good friends, the University looks towards a future rich in success and brilliant in accomplishments.

May the blessings of God remain with us in the days ahead.

Vernon Gallagher, CSSp

VERNON F. GALLAGHER, C.S.Sp.
President, Duquesne University

CONVOCATION PROGRAM

Wednesday Morning
November Eleventh

AT TEN O'CLOCK THE UNIVERSITY CHAPEL

SOLEMN PONTIFICAL MASS

The Most Reverend Ralph L. Hayes, D.D., *Celebrant*
Bishop of Davenport

Wednesday Afternoon
November Eleventh

AT TWO O'CLOCK HOTEL WILLIAM PENN

Presiding ....Reverend J. Gerald Walsh, C.S.Sp., Ph.D.
Academic Vice President, Duquesne University

Greeting ....Very Reverend Vernon F. Gallagher, C.S.Sp., Ph.D.
President, Duquesne University

SYMPOSIUM

Theme ....PHILOSOPHY AND SCIENCE IN AN AGE OF POWER

Chairman ....Very Reverend Paul C. Reinert, S.J., Ph.D.
President, Saint Louis University
Saint Louis, Missouri

Participating:

THE INTEGRATION OF SCIENCE AND PHILOSOPHY
Dr. Vincent Edward Smith
Professor of Cosmology
University of Notre Dame
Notre Dame, Indiana

THE RESPONSIBILITY OF THE SCIENTIST
Dr. Karl F. Herzfeld
Professor of Physics
The Catholic University of America
Washington, District of Columbia

THE RESPONSIBILITY OF THE PHILOSOPHER
Dr. Anton Pegis
President, Pontifical Institute of Mediaeval Studies
Toronto, Ontario, Canada

THE ROAD AHEAD
Mr. Thomas E. Murray
Member, Atomic Energy Commission
Washington, District of Columbia

Thursday Morning
November Twelfth

AT NINE-THIRTY O'CLOCK HOTEL WEBSTER HALL

PROCESSION to St. Paul's Cathedral

AT TEN O'CLOCK ST PAUL'S CATHEDRAL

SOLEMN PONTIFICAL MASS

His Eminence Francis Cardinal Spellman, D.D., *Presiding*
Archbishop of New York

Right Reverend Monsignor Andrew J. Pauley, *Assistant Priest*
Very Reverend Anthony M. Benedik, *Assistant Deacon*
Very Reverend James J. O'Connell, *Assistant Deacon*
Reverend Eloy I. Grundler, *Master of Ceremonies*

The Most Reverend John F. O'Hara, C.S.C., D.D.
Archbishop of Philadelphia
Chaplains to the Metropolitan
Reverend Francis S. Clifford Reverend James L. Lavelle

The Most Reverend John F. Dearden, S.T.D., *Celebrant*
Bishop of Pittsburgh
Right Reverend Henry A. Carlin, V.G., *Assistant Priest*
Very Reverend Cyril J. Vogel, *Deacon*
Reverend William G. Connare, *Subdeacon*
Reverend Jacob C. Shinar, *Master of Ceremonies*
Reverend Joseph A. Raynak, *Assistant Master of Ceremonies*

Sermon..................His Eminence Francis Cardinal Spellman, D.D.

Music by the Combined Junior and Senior Choirs of
St. Paul's Cathedral. Paul Koch, M.A., Musical Director.

Thursday Afternoon
November Twelfth

AT TWELVE O'CLOCK HOTEL SCHENLEY

LUNCHEON

Presiding..............His Eminence Francis Cardinal Spellman, D.D.
Archbishop of New York

Invocation ....The Most Reverend John F. O'Hara, C.S.C., D.D.
Archbishop of Philadelphia

Welcome .... The Most Reverend John F. Dearden, S.T.D.
Bishop of Pittsburgh

Address .... His Excellency, M. Henri Bonnet
Ambassador of the French Republic
Washington, District of Columbia

Benediction .... Very Reverend Francis H. McGlynn, C.S.Sp., S.T.D.
Superior, American Province,
The Congregation of the Holy Ghost

AT TWO-THIRTY O'CLOCK — HOTEL SCHENLEY

ACADEMIC PROCESSION

From Hotel Schenley to Soldiers Memorial Hall

Right Reverend Joseph A. Nelson, S.T.D., P.A.
Honorary Grand Marshal

Reverend J. Gerald Walsh, C.S.Sp., Ph.D.
Grand Marshal

AT THREE O'CLOCK — SOLDIERS MEMORIAL HALL

DIAMOND JUBILEE CONVOCATION

Presiding .... His Eminence Francis Cardinal Spellman, D.D.
Archbishop of New York

Processional .... March from *Occasional Oratorio,* Handel
Mr. Hugh MacDonald, Professor of Organ

The National Anthem

Invocation .... His Eminence Francis Cardinal Spellman, D.D.

Address .... The Honorable James A. Farley
New York City

Presentation of Recipients of Honorary Degrees
Very Reverend Vernon F. Gallagher, C.S.Sp., Ph.D.
President of Duquesne University

Conferring of Degrees .... The Most Reverend John F. Dearden, S.T.D.
Chancellor of Duquesne University

Benediction .... The Most Reverend Coleman F. Carroll, J.C.D., D.D.
Auxiliary Bishop of Pittsburgh

Recessional .... *Trumpet Tune and Air,* Purcell
Professor MacDonald

▼

THE DUQUESNE UNIVERSITY

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HONORARY DEGREE CITATIONS

HENRI BONNET

HENRI BONNET, *author, lecturer, patriot and diplomat—*

With characteristic generosity you have dedicated the prestige of your scholarship and the warmth of your personality to the service of your country. You have held her flag aloft in the dark night of war and the drear day of its aftermath. Amid the anxieties of the present you have helped weave those ties of respect and affection which bind our nations in strong alliance.

Because of your contributions to the cause of international understanding and because Duquesne University springs ultimately from the land you represent, I ask our Most Reverend Chancellor to confer upon you the degree of Doctor of Laws Honoris Causa with all the rights and privileges thereunto attached, and cause you to be invested with the hood appropriate to that degree.

BENJAMIN FRANKLIN FAIRLESS

BENJAMIN FRANKLIN FAIRLESS, *teacher, engineer, and chairman of a mighty corporation—*

With easy grace and modest reserve you bear the distinctions that town and gown have rightly laid upon you. Your notable career stands as a symbol of hope and inspiration for the youth of this troubled nation, and gives the lie to those who minimize that breadth of opportunity wherein America is great.

The boundless energy and piercing insight which you bring to every problem have left a lasting imprint on the huge and growing industry whose name is one with yours.

In recognition of the exalted position which you have attained in the ranks of business men throughout the world, I ask our Most Reverend Chancellor to confer upon you the degree of Doctor of Commercial Science Honoris Causa with all the rights and privileges thereunto attached and cause you to be invested with the hood appropriate to that degree.

JAMES ALOYSIUS FARLEY

JAMES ALOYSIUS FARLEY, *business executive, expert in the art and science of self-government, former member of the Presidential Cabinet—*

Your open friendliness with great and small reflects that selfless love of neighbor which all commend and few attain.

Your life-long record of public service displays a devotion to principle so deep and uncompromising that the honesty and sincerity of your career stand as models for all who would enter the arena of political affairs.

In recognition of your dedication to the ideals of our country and the rights of its people, I ask our Most Reverend Chancellor to confer upon you the degree of Doctor of Social Science Honoris Causa with all the rights and privileges thereunto attached, and cause you to be invested with the hood appropriate to that degree.

MOST REVEREND RALPH LEO HAYES

MOST REVEREND RALPH LEO HAYES, *athlete, educator, churchman and prelate—*

The wholesome vigor of your early youth has fulfilled its promise of greatness in the achievements of maturity. As superintendent of schools, as pastor, and as missionary bishop, your warm personality and quickness of intellect gained widespread acclaim.

As rector of the North American College in Rome and as Ordinary of the diocese of Davenport over whose destinies you now preside, you have led the way with wisdom, justice, and charity.

Duquesne University holds it a privilege to number you among its alumni and to bestow on you today its corporate accolade.

For that reason, I ask our Most Reverend Chancellor to confer upon you the degree of Doctor of Letters Honoris Causa with all the rights and privileges thereunto attached and cause you to be invested with the hood appropriate to that degree.

RICHARD KING MELLON

RICHARD KING MELLON, *financier, general of the army, respected leader and father of the new Pittsburgh—*

The towers of steel and stone and shining armor that newly grace our fair metropolis may one day crumble in the dust of ages yet to come, but the glory of that united civic effort which your energy has brought about will still shine like a beacon on the path of social progress.

You have gathered together the resources of the public chamber and the private study, the market-place and the council-room, the lecture-hall and the drafting-board; you have welded them adroitly into a magnificent force whereby the impossible has become the real, and tomorrow's beauty has been called forth like the Phoenix from the smoke and ashes of the past.

Wherefore, I ask our Most Reverend Chancellor to confer upon you the degree of Doctor of Engineering Honoris Causa with all the rights and privileges thereunto attached, and cause you to be invested with the hood appropriate to that degree.

ANDREW GERARD VAN MELSEN

Andrew Gerard van Melsen, *professor of the philosophy of nature and science at Charlemagne University of Nijmegen in the Netherlands, and Professor Extraordinary at the State University of Groningen—*

Your dual specialization in the fields of science and philosophy has enabled you to probe the mysteries of nature with extraordinary clarity and effectiveness; your many publications have established you as a leading world authority in your chosen area of study; your brilliant lectures, both in and out of the classroom, have stirred the minds of students on both sides of the Atlantic.

Because these many activities have merited the respect and gratitude of the academic world, I ask our Most Reverend Chancellor to confer upon you the degree of Doctor of Education Honoris Causa with all the rights and privileges thereunto attached and cause you to be invested with the hood appropriate to that degree.

ADDRESSES
DELIVERED AT THE
DIAMOND JUBILEE CONVOCATION

SERMON, PONTIFICAL MASS . . . . His Eminence,
Francis Cardinal Spellman, D.D.,
Archbishop of New York

LUNCHEON ADDRESS . . . . His Excellency,
M. Henri Bonnet, Ambassador of the
French Republic, Washington, D. C.

CONVOCATION ADDRESS . . . . "Americanism"
The Honorable James A. Farley,
New York City

CONVOCATION SYMPOSIUM

Theme

"PHILOSOPHY AND SCIENCE IN AN
AGE OF POWER"

INTRODUCTORY REMARKS
Very Reverend Paul C. Reinert, S.J., Ph.D.,
President, Saint Louis University,
Saint Louis, Missouri

THE INTEGRATION OF SCIENCE AND PHILOSOPHY
Dr. Vincent Edward Smith,
Professor of Cosmology,
University of Notre Dame,
Notre Dame, Indiana

THE RESPONSIBILITY OF THE SCIENTIST . Dr. Karl F. Herzfeld,
Professor of Physics,
Catholic University of America,
Washington, D. C.

THE RESPONSIBILITY OF THE PHILOSPHER Dr. Anton Pegis,
President, Pontifical Institute of
Mediaeval Studies,
Toronto, Ontario, Canada

THE ROAD AHEAD . . . . Mr. Thomas E. Murray,
Member, Atomic Energy Commission,
Washington, D. C.

SERMON, PONTIFICAL MASS

HIS EMINENCE FRANCIS CARDINAL SPELLMAN, D.D.

ARCHBISHOP OF NEW YORK

Not many days ago I returned to my beloved homeland from overseas, carrying deep within my heart a prayer of great gratitude to God that there *is* an America—land of liberty, peace and progress—a prayer that our great and noble nation may lead oppressed peoples and enslaved nations to freedom in a world where every home may be secure from fear and want, where every man may fearlessly exercise his God-given rights under a free government representing the will of the people, a prayer that through man's cooperation with God's grace there may be procured for all persons and peoples of the world a full measure of life, liberty and happiness.

Some of the lands I visited were dark with the stark, ugly, pitiful ruins of war, dark with present poverty, dark with fear for the future. Yet midst this darkness I saw light—the light that shines from out hearts of peoples who have the will to win—the will to regain the ancient heritage of their forefathers, their spirit aflame with the steadfast determination to walk again in godly ways towards the goal of enduring freedom and peace.

I bring back with me memories of sights and scenes that shall be forever imprinted upon my heart and mind, many that sadden me, others that lift this sadness, leaving but the cherished memory of heroism, happiness and holiness. The most precious of these is the memory of the Holy Father. Radiating calmness, courage, steadfastness and love in these times of restlessness, faithlessness, hatreds and fears, he instills in all deep rooted confidence in the mercy of God and the mission of the Church. The Vicar of Christ is a living light, so Christ-like is he in his spirit of prayer, in his love of souls, and in his compassion for the stricken of this woeful, weeping world. Pius XII is God's living beacon casting its brilliant beams of hope, faith and charity across the shadows of an imperiled, anguishing world.

I come to you today to participate in the observance of the Diamond Jubilee of Duquesne University still inspired and sustained by this spirit of our Holy Father—our beloved Pope of Peace. As our Supreme Shepherd looks out beyond the Seven Hills of Rome, his gaze rests not alone upon one land or one people. The eyes of his great soul sweep the earth. He watches over the world of men with the Mind of Christ, caring for them with the Heart of Christ, praying for them the peace of Christ, begging for them the blessings of Christ. And we who are gathered here in this magnificent Cathedral dedicated to the Apostle Paul, are this very day exercising two of the most sacred of these God-given blessings, the grace of faith and the freedom devoutly to follow our faith.

It is well that we are met here in thanksgiving for the manifold blessings God has bestowed upon Duquesne University during her lifetime of seventy-five years, for the bond between Mother Church and Alma Mater is a deep and historic one. It goes back to that spring-time of Europe, the 12th and 13th centuries, when the very air was alive and keen with a sense of intellectual adventure and discovery—and Paris was a magic name attracting to its lecture halls students and thinkers from all parts of the Western World. Even unto this our day the period of St. Bernard, Abelard, William of Champeaux, and all the other stimulating professors of that time, impresses us as one of the most romantic in the entire history of education. But not romantic only. It was a deeply significant period as well, because out of it came the university as we know it in its finest form.

There had been schools before in the world, distinguished schools—but the university was a new kind—an aggregate of schools held together by a common purpose. It was not concerned with buildings so much as it was with ideas and their formulation. Ranging from far and wide, the university took for its province the whole field of knowledge and in that enormous range it made generous provision for the study of religion. Indeed it was the knowledge of God which was the final objective of the scholar's quest whether he studied law, medicine, the arts or philosophy. All knowledge was seen as crowned by theology—since that was the science which treated of God and of His ways with men.

Small wonder that such a magnificent concept of learning which would bring all human knowledge to its source-point in God should have received not only the approval but the enthusiastic support and encouragement of the Church. Paris, the first university in Europe, received its initial authorization from the papal legate and if we call the roll of later universities, Bologna, Oxford, Cambridge, Louvain, Salamanca and Vienna, we shall find that they, too, derived their reason for being from the Catholic Church. It is for this that we reaffirm the deep and historic bond between Mother Church and Alma Mater. In the measure that Alma Mater has remained faithful to the inspiration and teachings of Mother Church, in that measure has she fulfilled the high hopes that have been reposed in her.

And high have been these hopes, sustained by the firm conviction that man can know God, that he should guide his life in terms of that knowledge, that he is a citizen of two worlds—this present one of time and space and that other one with God which lies beyond the ramparts of death. Medieval man realized this fundamental truth and programmed his search for knowledge so that he could cultivate both a natural and supernatural life. And the university of medieval man stands as a monument to his clear recognition of the fact that he was made for God and that all his gifts of mind, heart and body were to be used in God's service and for His glory.

It was an immense and inspiring tradition he bequeathed to society and fortunately it has not been totally lost to our modern world due to the many flourishing Catholic universities among which we proudly acknowledge Duquesne. But witness the havoc that has been wrought in those centers of learning that have rejected the original program and hierarchy of studies instituted by their founders. Where theology once reigned in queenly splendor, there are only deserted chairs and discredited professors. Where philosphy once held out to students the sure and stable norms of right reason, there now is only the dreary denial of reason and the contemptuous dismissal of the fact of the existence of absolute truth. If wisdom wears a shroud in such halls of learning, it is for good reason. She is dead and the seeds of new life for her must be sought elsewhere.

This is not a mere academic matter. Rather it is one with ominous implications for all of us in America. If the spiritual heritage of our fathers is not reverenced, fostered and preserved in our higher institutions, if millions of college-bred men and women are to be brought up to believe that God does not exist or that His existence has no meaning for them, then such a condition will be more than an occasion for academic mourning—it will be nothing less than a national tragedy. Some lessons are written very boldly on the pages of history and none more boldly than this: "They that forget God shall go down to destruction."

Our fathers, whose remembrance of God was one of their dearest legacies to us, understood clearly that religion and morality are the indispensable supports of an enduring republic and they wrote their convictions into those imperishable American documents which guarantee our freedoms. They did not believe that democracy of itself could long survive without religious teaching and religious motivation. They did not speak of a "religion of democracy" because they were profoundly aware of the debt our way of life owes to the religion of Christianity and they were equally aware that if Christianity were repudiated for some pale, secular substitute then the days of democracy in America would already be numbered.

It is the pathetic folly of prideful men to imagine that they can take the words and externals of Christianity, cut them off from their roots and make them serve as window dressing for a so-called religion of democracy. These words and externals have meaning only insofar as they correspond to the inner reality of Christianity as revealed by Jesus Christ. It is this reality which took what was best in the Greek and Jewish traditions and extended them into a new dimension where there would no longer be Jew or Gentile, slave or freeman, male or female but all would be one in Jesus Christ. Under the shattering impact of this revolutionary doctrine, Christianity boldly strode forward and remade society with its gospel of freedom—the freedom of the sons of God, freedom to think right, to choose right and to live right. Against such a gospel the pretensions of an exclusively secularist "religion of democracy" are revealed in their true light as shadows without substance. How, for instance, is it possible—apart from revealed religion—to speak of the infinite value or the essential dignity of man unless there is an Infinite Being to determine that value or dignity? How is it possible to reckon the rightness or wrongness of actions unless there is an Absolute Standard to appeal to beyond the power of governments or men to influence or force? How, indeed, can the equality of men be spoken of with any meaning except in their equality before God? There are no satisfactory answers to these questions unless belief in God and in His revelation is acknowledged as the primary condition for understanding and interpreting the democratic way of life.

Let that belief in God and in His revelation which once figured so largely in our national life, become once again a stimulating reality, then can the present course of history be channeled away from war into the blessed ways of peace. But that channeling will be no easy task. It is never easy to cut through rock and shale, but what are rock and shale compared with human pride and greed and envy, selfish egoism and narrow nationalism. These are the main obstacles to peace in our time. For peace is not obtained by laying down one's guns. It is gained by lifting up one's heart to God and pledging complete allegiance to His will. It calls for a profound spiritual conversion so that God is at the center of all we think, all we say and all we do. The resources of such a conversion are enormous and they could meet the needs of our world in a miraculous manner. To have God as a constant point of reference in daily life is the one absolute way to meet and to solve the great problems we face at present in our society. Science alone cannot solve it for the problem is spiritual. Only man himself can meet and solve this problem for it is within his power to determine the uses of science. In his determination moral principles must come to the fore and be applied. With their application science thus becomes a handmaid to civilization rather than its assassin. Millions of Americans last week viewed on television a demonstration of a new type of atomic weapon. Designed for a more effective fight on cancer, this new device unites cobalt and uranium. The same elements which in the words of a renowned scientist can "bring about the annihilation of all life on earth," have now been combined for the first time to offer hope of life to those who were formerly hopeless victims of cancer. How different is that picture of science operating under a strong moral impulse with men confidently looking to it for aid in the solution of their problems, from the terrorizing picture of science run amok with no moral restraint!

But it is not science only that stands in need of morality. The need extends through all man's activities—to his life at home, at work and in the community. Nothing less than a complete re-dedication to those moral teachings of Christ which brought Western man to his greatness and enabled him to transform society, is called for today. Peoples who would practise Christ's teachings would re-discover and re-capture the spiritual steadfastness and calm that would enable them to surmount and solve the manifold problems of today's selfish, tragic, unbelieving world. Then would men and nations begin once again to know the precious blessings of peace of mind and heart which our forefathers possessed in such abundance.

Our universities can play a vital role in helping men to re-capture the sanity of that older time by correlating man's knowledge to morality, by training men to be good, not merely scholarly. It is the good and God-revering men who will save the soul of the world, not the "intelligentsia." It is the distinction of Duquesne University that it sees goodness and knowledge under the same divine standard that medieval man saw them. For seventy-five years Duquesne has sent forth from her halls of learning students who have had clearly defined concepts of morality to guide them in their many and varied careers of life. Over the decades students have come to her as children to their mother, and well has she fulfilled her sacred trust, pouring into their minds knowledge of God and men, into their hearts unbounded love of God and men, and today Mother Church proudly salutes Duquesne University as a devoted, loving and cherished Alma Mater.

LUNCHEON ADDRESS

HIS EXCELLENCY, M. HENRI BONNET

Ambassador of The French Republic

WASHINGTON, D. C.

It is for me a two-fold privilege to pay tribute first of all to the Congregation which was founded, two hundred and fifty years ago, in Paris, by a young Frenchman whose ardent faith inspired him to bring Christian civilization to the most forsaken in this world, and to those lands which did not know of its blessings. I also wish to pay tribute to Duquesne University in the name of a country which has always had at heart the interests of spiritual life, the advancement of knowledge and the promotion of culture.

The great example given by Claude François Poullard des Places, at the beginning of the eighteenth century, and which, since then, has inspired the admirable apostolate of your congregation, lives on today with all its original virtue and remains as a fruitful lesson for all those who strive to defend and exalt the spiritual values which make for the glory and the solidarity of our contemporary societies. In spite of centuries of progress, and of the sustained effort of generations brought up in these principles, there are still vast territories to open to the benefits of civilization, and new threats have arisen which could uproot the moral foundations of our communities to the advantage of a ruinous materialism.

It has often been said in speaking of our world that it has grown smaller with the increasing speed of communications but, however important may be means of rapid transportation, there is still another subtle and essential system of communications between men and peoples which we owe to ourselves to safeguard and to ever develop, a system whose very existence rests upon a community of beliefs and of convictions, a system which cannot be traced on a map but which, nonetheless, constitutes the strong framework of our free societies.

To this mission which must never cease and which tends to weave together new links not only between our countries but between individuals themselves, beyond the boundaries of our free countries, in an ever more intimate communion of soul and spirit, Duquesne University brings a constant support and a boundless devotion. I am happy to bear witness here to the primordial role played by establishments of advanced teaching of your great country in strengthening this bond of mutual understanding which unites and sustains us in our march toward progress. For the visitors who come to the United States from France and from Europe, it is a joy and a comfort to see the flowering of intellectual activities in all domains, arts, sciences, letters, techniques, as well as the prodigious development of your works of education and of learning. You know how to provide your students with that solid basis of knowledge which must precede indispensable specializations, to lead them towards the search for and the appreciation of facts, to stimulate their faculty of judgment and of understanding, and to interest them in the destiny of man and in their noblest and highest duties.

Here are the values, spiritual, moral and intellectual which, as a tragic consequence of a long period of wars are now, once more, challenged; we are defending today the democratic freedoms, the freedom of the individual.

In the conflict opposing two worlds, the normal road to negotiation has been for years studded with new obstacles. The tried method of mutually acceptable adjustments is not working on account of totalitarian intransigence. Under those circumstances a line of conduct is forced upon us with blinding clarity. We must preserve, reinforce, increase our solidarity, suppress everything that divides us, look for everything which can unite us; apply between us the methods of understanding, conciliation, mutual entente from which the adversary is shying away; define in common agreement the objectives that we want to reach; divide equitably between ourselves the efforts and the burdens.

At no price can we depart from this firm determination and from this continuity in our plans, an essential condition for the triumph of our just cause. After years of tension, of sacrifices sometimes stained with blood, like those that our two countries have made in the Far East and that France must still make in Indo-China, it is highly praiseworthy that our peoples have remained vigilantly on their guard. Our public opinions, thirsting for progress and conscious of the wonderful realizations which could be ours in our own countries and the huge territories whose resources are not yet exploited, are sometimes irritated when they see spent on armaments resources which in other circumstances could bring so much happiness to humanity. These opinions may have a tendency to severely judge friends and to let divergencies which in fact are superficial become wider whilst in reality they are easy for us to eliminate.

We must not, through lassitude, give in to these temptations; we must above all avoid division between us; this is the goal of our enemies; it is their hope and the object of their propaganda and of their maneuvers. Again recently we have had obvious proof of this tactic of dissociation towards the West: prevent Western Europe from uniting, from realizing its defense community, from bringing down barriers that history has raised on its frontiers and from marching onto the road of federation; separate it from the United States by forcing a wedge in the block of the Atlantic countries, destroy the pact that unites them, obtain the withdrawal of American divisions from Europe and the closing down of air bases there, such are the characteristic features of the political strategy of the USSR.

To allow it to weaken the solid edifice that we have built would open the road to new expansions of the bolshevik conquest which has already engulfed half of Europe and of Asia.

But I have no doubt whatsoever that we shall know how to remain together side by side in a fraternal union. All our free nations have given to each other too many mutual proofs that they can count upon each other with full confidence, in the good as in the bad days, for anything to shake their solidarity. France will never forget that twice the soldiers of

America came to fight on her soil and that, in 1944, freedom came back to her in the folds of the Stars and Stripes. She will not forget either the enlightened aid that she has received during the severe trial she has gone through to repair, stone by stone, the ruins accumulated by the Second World War and to rebuild, through the labor of all her people, an economy wrecked by four years of fighting, of blockade and of an exhausting regime of occupation. The American people, by supporting their congress and their government, have made the Marshall Plan possible, and have given one of the most remarkable proofs of foresight known to history.

But you on your part can also have full confidence in your friends in Western Europe and I shall try to justify this statement by citing the example of my country. In spite of the war suffering, of a still unsolved problem of housing, of the fact that France must maintain fourteen divisions in Europe and wage a terrible war at the other end of the globe, a war absorbing more than ten elite divisions; in spite of these super-human efforts, the counter-effects of which are being reflected on the standard of living of the population, communism which found strength in the Resistance against the invader has lost ground and has no chance whatsoever of dominating my country.

The great majority of her people remain faithful to our common democratic ideal and determined to defend it against any peril, domestic or foreign. Contrary to certain calumnies too widely spread, the average number of working hours for French workers are forty-five a week, in spite of the fact that several industries are not working full time, a consequence of the international trade difficulties which cannot be solved by our country alone. I would like to knock down another slogan according to which taxes are not sufficiently heavy in France; in fact, according to the statistics of the inter-allied experts of NATO they exceed thirty per cent of the gross National income, which is the greatest proportion in all the Atlantic nations. Above all, my country accepts to fight alone with the aid of the Associated States Armies the flow of communism in South East Asia. Facing the troops of the French Union, which have been bleeding in that far away land for more than seven years, there is the enormous mass of the bolshevik states, China, the USSR and its satellites. If the dam that we have built were to give way, more free countries would, under the weight of this pressure, fall in their turn; we would lose the indispensable resources from one of the regions richest in raw materials and most populated of the globe. In this task of public salvation, we have your material aid. It is well spent. France, for her part, has given a complete independence to Viet Nam, to Cambodia and Laos. She is fighting for the cause of liberty.

So as to create in Europe a force which can balance the greatly increased power of the eastern block, we have, moreover, taken the initiative to propose treaties which will create a western European union; one of them has already permitted the implementation of the Schumann Plan which has given to a common authority federal powers over the heavy industry of six countries, among which are France and Germany. We are now working towards the establishment of a defense community and of a political authority which is to emanate from a European popular election.

On both sides of the ocean, we have, and I do not hesitate saying so, realized some prodigious results. Never has experience shown more clearly the success of a policy. The Atlantic Nations can persevere without fear along the line that they have chosen. It leads to liberty and to peace.

CONVOCATION ADDRESS "AMERICANISM"

THE HONORABLE JAMES A. FARLEY

NEW YORK CITY

I am going to discuss Americanism, a subject so vital, not only to us of today but to the future of our country and the peace of the world. Americanism is the one "ism" that sums up all that America has been, is, and can hope to be. It is a philosophy of government that has ever recognized the God-given right of man to carve out his own destiny, to share in his own government and to make his own laws.

Americanism is an impelling subject. It is an interpretation of the kind of democracy which must win the battle for world peace, if there is to be any peace at all. We are living in a period of world stress and America must recognize the implications of these times. These are truly "times that try men's souls", times when there cannot be too much restatement of values or reiteration of the principles that all Americans hold dear. This is our America and the people of no other country in this war-ravaged world enjoy the privileges and blessings that are ours. It is true that World War Two has brought about maladjustments in our economy and its impact is to some extent still with us. But the most vehement denouncers of our democracy cannot deny that our people are better fed, housed, and clothed than any other people anywhere in the world. This is the answer to those who would substitute the doctrine of Karl Marx for the Declaration of Independence, and the "Internationale" for "The Star Spangled Banner." The sometimes terrifying aftermath of war must not be permitted to cloud the clear vision of the American people, nor can we permit the enemies of America to inject their poison into the pure stream of democracy that flows through the hearts of the American people and keeps America "always the land of the free."

War is a devastating experience. It is the young, the strong, the virile, who must fight. It casts its shadow over millions of homes and its utter futility, its needless waste, its wanton slaughter, shake faith in the civilizing influence of centuries of culture and progress. Each succeeding war, always more terrible than the last, breeds fear of the next war, and since that day when man's scientific attainments enabled him to smash the atom, the acrid smoke of the atomic bomb has lingered in the nostrils of mankind and all look with shrinking dread for the next war to destroy civilization.

Excluding the Revolution, which lighted an inspiring new beacon of liberty for all the world to see and wrote a new chapter of government and human relations, this nation of ours has known six wars, and the recent conflict in which we participated with other members of the United Nations. It has had its grim period of internal strife out of which came a nation "one and indivisible" forever. America has never known defeat. The great virility of our country, its unbeatable qualities, are attributed by other nations to our vast natural resources, our great ports, enormous industrial plants and the productive ability of our people. But there is a deeper reason for our unequalled record both in peace and in war, an underlying cause for our triumphs on the battlefield, a factor that transcends all material considerations and inspires our men and women, peace-loving as they are, to sacrifice loved ones, homes, even life itself, when danger threatens America.

I have traveled the length and breadth of our country many times. I have made many visits to each state in the Union. I have not gone as a casual visitor, but with the determined purpose of studying conditions and learning to know the people. I am personally acquainted with hundreds of citizens in each state. My correspondence with my fellow citizens down through the years has been enormous. From my own contacts and observations I have sensed the spirit of America to the extent that I am willing to attempt to define that all-pervading spiritual essence that we call Americanism. There are over 157 million Americans and I venture to guess as many definitions of Americanism, but all put together and reduced to their simplest form may be summed up in the word "freedom", the freedom that exists only in America, and is democracy in its best form. Freedom is the blood and bone and sinew of America, the underlying force, the inner power that creates the spirit singular to our Nation. Freedom and Americanism are synonymous, and I am thinking of freedom in terms of what it holds for our future, and its effect upon the future of the world.

Let us examine this remarkable force called freedom that we cherish by instinct and tradition, a freedom we fought for, not only for ourselves but for the people throughout the world. Our freedom is credited with being little more than a century and a half old. However, freedom was in the air when the first Pilgrim landed on the shores of Massachusetts. It impregnated all of those who followed them and when on July 4, 1776, the Liberty Bell announced to the world that the Continental Congress had cut all ties with the old world, the hearts of the colonists already were aglow with liberty's flame and they went forth to achieve victory. The victory they won gave to the world its greatest nation and a system of government essentially unchanged since that time. In this chaotic world of today, it holds out the one hope for the freedom of mankind.

Our freedom has carried five generations through successive stages of progress, to living standards that have astonished the world. It does not owe its origin to any of the decaying governments of the past. Our form of government was born of virile and independent thought. It is predicated upon the Declaration of Independence, the greatest charter of human liberty ever penned, a document that kindled a new light in the darkness of a world where monarchs ruled by divine right, and whose words were the sole arbiter of man's destiny. Our forefathers, in defiance of the rulers of the world, declared that "all men are created equal and endowed by their Creator with certain unalienable rights, among them life, liberty, and the pursuit of happiness." Never since the cave man discovered fire has human kind discovered anything so important to human progress as this philosophy upon which was built a government of, for and by the people, a government with a minimum of hampering laws, a government that gave unrestricted opportunity to individual enterprise and developed in our people the stamina and spiritual strength that have carried America onward and upward through the years.

Our freedom couldn't be patterned after any other form of government, for when America declared herself free and independent there was no real freedom anywhere in the world. The faith and industry of our people, developed through our system of free enterprise, have paced the world spiritually and materially. From the earth and from the depths of the sea and from the skies above we have plucked our resources and our men of science have directed them into many channels. Our manufacturers have produced at enormous speed the things that science and invention have designed for the convenience of man. Men of all faiths and creeds, teachers, poets, philosophers and authors have inspired us to greater efforts and pointed the way to higher standards and better living. American enterprise has been so truly a happy blend that when war came and all of Europe stood with backs to the wall before the might of Nazi aggression, our productive ability was turned into a gigantic effort that enabled America to supply the allied armies with food and manufactured material of war that brought victory to our united arms.

There are those who attribute our success to our great natural resources, but nature has been bountiful to other countries of the world. Raw material exists everywhere, but the free enterprise, the untrammeled initiative is not there for its development. Some attribute our success to peculiar national characteristics, but they forget that we are peopled by comparatively recent arrivals from practically every quarter of the globe. But we are descended from ancestors who, since America was born, looked toward our country with longing eyes and who implanted in the hearts of their offspring a faith in America that made them Americans, even before they landed on our shores.

These people of many races and diverse faiths, coming from many lands where they have been virtually slaves of the state, found that here in America every individual was on his own; that no higher authority attempted to order their lives; that they were free to worship the God of their fathers; that great resources were here to be developed by individual initiative and industry. They realized how precious was the heritage of liberty bequeathed by those men of faith and vision who penned the Declaration of Independence and framed our Constitution.

Much is said of the American way of life. We hear it eloquently discussed as though it were a social and political philosophy, a chart for the guidance of the lives and activities of men and women. But the American way of life is not a theory; it is not a system of philosophy; it is not a bare chart to thinking, reasoning or living. It is the amalgamated habits and characteristics of our people, acquired through years of uninhibited relationship with their fellows, through free enterprise, free thought, free expressions and self-government. Those who follow the American way of life reap the reward of their own labors, worship in their own way, accept a full share of responsibility of government. The American way is the way of free men—it is democracy, the foundation of America's strength, the rock upon which is erected the well-being of our people.

In America the government belongs to the people. In the dictator countries the people belong body and soul to the government. In America every citizen is a partner in the business of government and must bear his share of individual responsibility. America, by virtue of its strength, power and resources, is in a position of world leadership, and every loyal American must back this leadership to the full limit. Democracy, the American way of life, is challenged now by powerful forces, and should the will of these forces prevail, the hope of peace in our time will never be realized.

But America will rise to the responsibilities of world leadership, and the American people will give their full support to democracy's cause. They did not give American lives on the battlefield to win democracy only to lose it at the diplomatic table.

Freedom is a dynamic, liberating force. One need walk only to the nearest playground or college athletic field to discover why we have invariably been victorious.

Beyond question we are the greatest competitors in the world. I do not advance this as an American boast, but rather as a manifestation of the liberating force of freedom.

The American knows no limit of achievement, because no limit exists in America. Our children sense it at an early age, because it is born in them. Our young people think only in terms of winning at whatever they attempt. Victory is the image always before them; defeat is almost impossible for them to imagine. Considered alone, we call it the competitive spirit; actually it is the chief product of freedom. It, more than anything else, accounts for American ingenuity in the field of production, and victory on the field of battle.

Tolerance for each other's thoughts, for each other's religion, for each other's race are all manifestations of freedom. There is the demand for justice, for equal treatment under the law; there is the conviction that opportunity is unlimited for all. And we must not overlook an outstanding American trait, sympathy for the underdog. We love to see him win, because we feel he is a victim of injustice. This is one of the deepest roots of our Americanism.

What American has not experienced the thrill of seeing some highly touted competitor overcome by some little fellow who was not given a chance to win? It sets American crowds on fire with enthusiasm and it explains a great deal more than we think. It explains why we never have conceived might to be right; why we never have worshiped might as an end in itself; why the superman never has appealed to the great mass of Americans.

Can any of us picture an America with only one political party that always won, an America with all of its enterprises owned by the state, an America with only one press and that the government's? Yet it is the imposition of these things upon the underdog that threatens the world today, and it is the spirit of America, deep-rooted in the hearts of our people, that is going to fight with courage, strength and resourcefulness to preserve the democracy for which our blood and treasure were poured upon the battlefield.

It is little wonder that Hitler underestimated America; that he was contemptuous of democratic ways. And, it is a matter of concern that some of our allies in that war, nations we saved from annihilation by the Nazi war machine are now openly contemptuous of our system. They appear to be willing to placate enemies of democracy who are pouring out their abuse against America, making their absurd charges against American leadership, fomenting hatreds that they hope will weaken our leadership of the democratic cause. But, Hitler is dead, and the once proud German nation that followed his lead, while now making a remarkable recovery, is still suffering under the burden of defeat.

To the totalitarian mind the workings of the free spirit are incomprehensible. The totalitarian thinks only in materialistic terms. He cannot grasp the fundamental fact that robots may fight an orderly and unresourceful battle but it is the free man, fighting with heart and mind to preserve his sacred heritage, who must triumph. The superiority of the fighting qualities of free men over the slaves of the state has been demonstrated in two world wars, although it is evident that the totalitarians have not profited by these lessons. They still dream, as Hitler dreamed, of world conquest.

During the war our people had a taste of totalitarian restrictions made essential by military necessity. These have been employed in every war since the Nation was founded. But in adopting these restrictions it was with the idea of getting rid of them at the earliest moment. Our people were willing to endure them, to make any sacrifice to win the war, but they were a taste of totalitarian government they did not relish.

There are always those who wish for a continuance of a totalitarian government in times of peace because it worked well in war, but they are putting the cart before the horse; in fact, they are urging that we do without the horse altogether. Let them remember that it is our freedom in peace that has been our strength in war. We gave up a great measure of freedom to achieve victory but we insisted that those freedoms be returned as the national emergencies permitted.

I am a firm believer in public opinion. Examined over any reasonable period of time, public opinion is wise opinion. But its wisdom is in direct ratio to the people who contribute to it, and public opinion, from coast to coast, has finally realized that America has come of age and taken its place in the family of nations. Modern transportation and methods of communication make us close neighbors of every nation on earth, and the word "neighbor" has taken on a vast, new meaning.

I do not hold that we are in any way giving up this Americanism that is our very own, because we have assumed a new role forced upon us by our strength and power, the role of leadership of the democracies of the world. In accepting this responsibility we became citizens of the world. We all have our political affiliations but we are, first of all, Americans and, accepting as we must the obligations of world citizens, we must remain first, Americans.

We must realize that certain old divisions of opinions among us have all but disappeared. We must eliminate the words "isolationst", "internationalist", "interventionist" and "nationalist" from our vocabularies. In the light of world conditions today they mean nothing.

It is easy to unite in war. When survival is the common thought of us all, we are one, whether we speak of nations or individuals. But the making of peace is far more difficult. The fear of tomorrow drives men and nations to unwise decisions. The history of their shortsightedness at the peace table is the history of succeeding wars.

The United Nations plan, upon which people throughout the world have placed high hopes, has developed slowly because it is divided by idealogical fundamentals. Cherished visions of one world, and utopian peace, a brotherhood of nations, have been shaken.

But what we need today and will need for years to come is patient wisdom, not extravagance of thought. Extremists, those who would sacrifice America to some global superstate or those who would sacrifice the future peace of the world on the altar of blind patriotism must be ignored. They are not wise counsellors; they are special pleaders who ignore the common good. They shout the loudest but do not say the most.

There is an uncommon amount of common sense in America. Wisdom is the product of straight thinking applied to knowledge. Our job is to keep informed and clear-headed. While extremists wring their hands because they are not getting what they want, and we may be assured they will never get it, the American people can perform no greater service than to maintain reasoned judgment.

Totalitarian governments respect only material strength. Therefore, America must be strong. Our people are firm in their dislike of militarism but for our own protection we must have an Army and Navy and Air Force which command the respect of our potential enemies. We are in the game now—never again must our runners be caught off base. But as world leaders we must stay within the framework of democracy and its basic principles of liberty, equality and justice for all. Upon these principles rest our Americanism, and in them lie all hopes for peace, both at home and abroad.

CONVOCATION SYMPOSIUM

THEME

"Philosophy and Science in an Age of Power"

Introductory Remarks

VERY REVEREND PAUL C. REINERT, S.J., Ph.D.

Duquesne University is to be heartily congratulated not only on its Seventy-Fifth Anniversary but also for its wisdom in using this happy occasion to sponsor the discussion of a topic which is extremely practical and vital to all of us yet equally difficult to analyze and comprehend. Fortunately, few more qualified persons could have been invited to discuss this problem than the four members who are participating in the panel this afternoon. If I may, I should like to make a few introductory remarks intended to point up some of the basic problems which are implied in the title of our symposium: Philosophy and Science in An Age of Power.

When we study the history of Western thought, we discover a very odd thing. Every age seems to have suffered as much by what it knew as by what it did not know. An over-developed knowledge in one field often becomes as dangerous as a lack of knowledge. In fact, the over-development of one knowledge actually tends to produce a deficiency in another form of knowledge. Realizing that any brief, sketchy historical analysis is in danger of over-simplification, I think nevertheless that it is substantially true to say that the Greek and Latin civilizations developed philosophical and humanistic knowledge to the detriment of the theological knowledge which they did not possess. Because of this deficiency, they fell into mythology and state worship. The tragedy of Greece and Rome stemmed from this lack of theological knowledge and this defect vitiated their natural knowledge about life. The civilization of the Middle Ages developed theological knowledge but was deficient in scientific knowledge. When the Black Death came, they ran to the shrines only to perish by the hundreds because they did not know medicine and the means of controlling a plague. They did the best they could, but here as elsewhere in history God made it clear that normally He does not supply miraculously for a lack of knowledge attainable through human resources. The Renaissance developed a substantial knowledge of humanistic studies and to some extent of science, but this age largely abandoned theology. This deficiency in the Renaissance ended in statism and absolutism which became an unworthy substitute for this age's deficiency in theological knowledge.

Our modern age, the age of power, presents us with quite a different picture. Today we are not so much lacking in one or other knowledge as we are deficient in our ability to unify the knowledges we do possess. We live in an age of paradoxes. Whereas by our splendidly successful media of communication and travel we have achieved one world in the physical sense, we seem to be farther than ever from a world unity in the spiritual and cultural sense. At the very time when knowledge is expanding at an unprecedented rate, a very great number of people are skeptical about the ultimate validity of all knowledge. The proud boast that knowledge is power has boomeranged into the sinister threat that knowledge is indeed power to destroy. The roots of these problems are many and deep-set, but perhaps the deepest among them is the unshakable conviction among many scientists that the only knowledge worthy of the name is science; among many philosophers that the only true knowledge is philosophy; among many theologians that the only knowledge is theology. Such a destructive monism is actually self-destructive. Our age presents a paradox indeed, when men, though having all the knowledges available, refuse or are unable to unify and utilize these knowledges for the promotion of the best interests of the human family.

Not only are there many forms of knowledge—humanities, science, philosophy, theology—there are also many levels at which man can know. Failure to recognize this fact may destroy one form of knowledge or over-develop another form of knowledge to its own eventual disintegration. It is possible to identify at least three such levels of knowledge, all three of which a civilization needs if it is to develop properly. First, there is natural knowledge which is the basis of all knowledge and without which science and philosophy collapse. Then there is humanistic knowledge by which man comes to an appreciation of his own nature in a manner that cannot be attained by science. Finally, there is rationally demonstrative knowledge which is usually called scientific. Within this rationally demonstrative knowledge there are many kinds of science: mathematics with its mathematical constructs; the natural sciences with their hypotheses; philosophy with its rational demonstrations; theology with its explanations of God and the supernatural. Man needs all of these knowledges, and he must learn to unify and coordinate them into a pattern that is dictated by finality and man's ultimate purpose together with an understanding of man's way of knowing. Failure to achieve this unity of knowledge will strike a fatal blow at any civilization.

What I have tried to say thus far leads to this important conclusion: the unity of knowledge that people are seeking whether they be scientists, humanists, philosophers or theologians can be achieved neither 1) by denial of all other forms of knowledge, nor 2) by a reduction into one form which is equivalent in fact to a denial, nor 3) by an imperialistic domination of science or philosophy or theology, but only by the assumption of these various knowledges into a higher unity of wisdom. Only a higher and more inclusive knowledge can unite the technically distinct knowledges without liquidating their rivals or confusing important and even essential distinctions. What we need in the modern world is a knowledge, a wisdom which will unite all knowledge and place each in its proper perspective.

If we human beings were each forced to associate only with men who had the same form of knowledge as ourselves, it would be comparatively easy to understand why there would be such fierce rivalry, denial and confusion in today's world of ideas. But it is difficult to understand how even men who associate in a university where all forms of knowledge may be found have fallen into misfortune. Surely the mutual communication of knowledge which is the real reason for a university should operate to prevent one-sidedness, contradiction and ideological strife. Yet, sadly enough, too often we see teachers and researchers in the various fields of knowledge living physically in one academic community yet intellectually as distant from one another as the ancient barbarians. Not only do our universities lack a unifying wisdom but the professors seem oblivious of the very existence of forms of knowledge other than their own. University departments exist together like fish in an aquarium; they do not form an intellectual community. Yet here we are probing at the very meaning and essential life of a university.

And here is where a Catholic university such as Duquesne, possessing a Christian wisdom that can harmonize without destroying and a philosophy that can provide a theory of knowledge that can keep distinctions without conflict or confusion, here is where a Catholic university has a uniquely valuable contribution to make to American culture and, indeed, to world civilization. It is in gatherings such as this where philosophers, scientists, theologians, scholars of all types meet to discuss the knowledge they have and its relationship to other knowledges that we can hope to develop the wisdom this age of power needs. Only in this way can the philosopher come to appreciate the scientist and both together come to understand the theologian, thus establishing by their mutual effort a basis for unity in a university and in the entire outside community. Before introducing the first speaker, therefore, let me once again state that Duquesne University is doing a distinct service to American life and culture by fostering such discussions as this one in which I am privileged to have been asked to participate.

THE RESPONSIBILITY OF THE PHILOSOPHER

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It is scarcely necessary to say that my part in the present program is much humbler than the title under which I am speaking. There are many schools of philosophy in the United States, and I do not speak for all of them. There are many philosophical schools within the Church that in the structure of their philosophies are divided from one another. There are even many kinds of Thomism. For whom, then, am I speaking? Now I am not raising this question in order to separate myself from those for whom I might not care to speak or who might not care to have me speak for them. On the contrary, I am raising it in order to qualify my claim in speaking for St. Thomas Aquinas. There is a first and normal qualification which I shall here presuppose, namely, that since I may be misinterpreting him, I should be slow to attribute to St. Thomas what I would otherwise acknowledge to be under his inspiration. But there is another problem, no less serious than the problem of remaining faithful to the doctrines of St. Thomas.

The Angelic Doctor was essentially a theologian. This he professed at the very beginning of the *Summa Contra Gentiles.* He knew philosophy and the philosophers, and he used them extensively; and when he did so, he created some tremendously revolutionary philosophical ideas of his own. But it remains that he was a theologian. Fully believing in the existence of philosophy, he yet knew that he was living in a world that was higher than that of the reason, namely, the world of the divine revelation. And since the divine revelation had fulfilled man's dreams of beatitude beyond the comprehension of the philosophers, St. Thomas looked upon philosophy as having been superseded by theology in those metaphysical questions having to do with creation and with the nature and destiny of man. Whatever philosophy could teach on these profound questions the Christian Faith contained and taught in a way which was free of the errors, the confusion and the slowness of the philosophers themselves. In short, as a student of Christian wisdom St. Thomas believed that all that the philosophers had sought was found and verified in Christianity itself. What need, then, was there for philosophy?

This is an embarrassing conclusion, or at least an awkward one. If I have understood St. Thomas Aquinas correctly, there is a sense in which, in a Christian world, philosophy is out of date and artificial. It is out of date in the sense that the Christian believer does not now find himself in that state of ignorance with respect to his destiny which beset Plato, Aristotle and Plotinus. To them, the divine intentions were shrouded in mystery and expressed in myth. The destiny of man was, to say the least, a baffling problem, just as the divine liberty (not to speak of the divine liberality) remained an inscrutable divine secret. The Greeks knew that man's beatitude lay in or somewhere near that which is divine in reality—that is, *if* man was to reach beatitude. On the contrary, Christians know not only that man's beatitude is in God, but also that God has crossed from infinity to this world to make that beatitude known and open to all mankind.

If, then, the very end to which philosophy tends as to a possibility beyond time is now, through the Christian revelation, a reality available to all men, what need is there for philosophers? Truly, their point of view has been outmoded, and it was God Himself who did it. Conceivably, philosophy might lead unbelievers towards Christianity. But where can philosophy lead Christians themselves if they possess through their faith those truths which the philosophers have tried to reach and have done so not without errors and failures?

From this point of view, granting the correction of saying that the point of view of philosophy has been surpassed by the Christian revelation, we must look rather carefully in order to justify the existence of philosophers within the Christian world. For it is within the framework of Christian thought that I am here trying to speak of the responsibility of the philosopher today. I could, to be sure, make my assignment easy by saying that the philosopher is an indispensable man in our world because he is the one who will unify all knowledge. Unfortunately, this view has not been true for over two hundred years. Today philosophers, Catholic and non-Catholic, know little science and have little or no competence in it. How, then, can the philosopher unify all knowledge when his competence stops at the shoreline of science? We seem to be caught in a dilemma. Or rather, the philosophers do. For the Christian revelation seems to have rendered them antiquated and thus apparently useless, and the rise of science since the days of Galileo seems to have rendered them helpless and no less outmoded. Christianity knows more about God than do the philosophers, and the scientists seem to know the material universe better than they do. What, then, is left for the philosophers to do?

The situation could not be more awkward. Having asked, for whom am I speaking in speaking for philosophers, I am now finding that perhaps the answer is not worth the effort. But I have not reached this point in order to plead the futility of philosophy. On the contrary, I want to insist on the crucial importance of the philosopher in the world today. For if I have said with St. Thomas that in a Christian world theology has superseded philosophy, I must add with the same St. Thomas that, in becoming Christian, philosophy (like man) has gained rather than lost in meaning and importance; and, what is even more surprising, it has (again, like man) gained in rationality. On the other hand, though from the point of view of exact observation science is a better student of matter than is philosophy, yet it is from philosophy and not from the sciences that we shall learn the human role of scientific knowledge in the building of a temporal civilization. The scientist knows how to wield great power. He can explode a destructive bomb, run the Nautilus, and even apply atomic power to industry; but as a scientist he does not know to what human or inhuman purpose his control over nature is to be used.

This is the moment when, but for different reasons, the theologian and the scientist need the philosopher. The theologian must turn to him in order to receive a human voice through which to express the divine truths on which he is meditating, and thus to make these divine truths humanly understandable to men so far as this is possible. The scientist must turn to the philosopher in order to learn from him how to contribute to the growth of human rationality in man and in society, and how to make man's power over nature, not the means of destruction and slavery, but the instrument of man's greater freedom and humanization.

This is the issue which I wish to develop. It contains, if I am not mistaken, at least the starting point of the role of the philosopher in a Christian world living in an age of power. The natural beginning of what I have to say lies in the 13th century. That century was, as everyone says, the golden age of scholastic philosophy. It was also an age when Catholic thinkers believed both in the unity of all men under God and also in the unity of all knowledge within the purifying light of the Christian revelation. A St. Thomas Aquinas in the 13th century was able to see all knowledge as a totality, all truth throughout the universe as one, and the universe itself as a book of intelligible light in which the Christian wayfarer might read with his reason the message which his Creator had written there for him. Today, we still believe in the unity of truth, and we know that truth, originating in God, should be one. But whereas St. Thomas Aquinas wrote a *Summa Theologica* to express for his world the unity of men, of knowledge, of truth, and of the universe, it is at least noticeable that in the modern world we have no *Summa Theologica.*

Between us and the serene vision of 13th century theologians there have intervened many events. Two events are particularly noteworthy. From the end of the 13th century and onward, the old science of Aristotle was being replaced by what we call modern science. Along with this change, which was in fact a progress, another change was taking place which was in fact a disaster. Under the pressure of Greek and Arabian naturalism, the optimistic scholastic philosophy of the 13th century gave way to various skeptical philosophies in the 14th and 15th centuries. As a result, in the wake of the Parisian condemnations of 1277, faith, philosophy and science became more and more strangers to one another. Since the 17th century, there have been scientists for whom their science *was* philosophy. As for scholastic philosophers, they seemed to have become lost in manuals. Their philosophy lost its mediaeval roots in theology; at the same time, it never made serious contact with the rising world of modern science. Today, some Catholic philosophers—I mean, those philosophers who belong in some sense within the scholastic tradition—have the ambition to become pure philosophers, to be modern, to discard the antiquated ways of Aristotle and to embrace the philosophy and the science of the modern world in an effort to achieve a new and living scholastic synthesis.

At first glance, nothing seems more hopeful and legitimate than this desire of Thomists to become contemporary and to interest themselves in the life, the philosophy and the science of their world. It is encouraging to see Thomists devoting themselves to modern logic and modern science, and undertaking to develop a new philosophy of nature which has rid itself of the dead science of Aristotle and is in contact with the science of Planck, Bohr, Einstein and de Broglie. All this is assuredly healthy. From this point of view, Thomists are engaged in that work of reflection on scientific data of which the Holy Father has given an example in his allocution to the Pontifical Academy of Science on November 22, 1951. From this same point of view, it is noticeable that some modern analyses of the Thomistic proofs for the existence of God derive their data on the mutability and intelligibility of matter from modern physics. This is as it should be.

While in no sense contesting the interest of Thomists in modern science, however, I should like to point to a possible misadventure that may be involved in this search for modernity.

Originally, as historians have pointed out, Thomism was the philosophy of a theologian, functioning within theology as the instrument of a theologian seeking to understand his faith. Now it was in its work as such an instrument, as historians have likewise pointed out, that the philosophy of St. Thomas made its most original and creative contributions. This is a noteworthy historical fact. What this fact means is that the philosophy of St. Thomas Aquinas reached its most dynamic and living peaks as a philosophy when it was engaged as a rational instrument in the service of faith. Thomism as such an instrument is marked by the personal genius of its author—the man who said that he wanted to devote his whole life to meditating on the word of God. Since the 17th century, however, when Descartes put aside his faith in order to philosophize, more than one scholastic manual has been written "according to the mind of St. Thomas Aquinas" in the form of a pure and complete philosophy. Today, many think that to make Thomism live as a pure philosophy among other pure philosophies is the sign of its coming of age as a philosophy. Now this is the heart of the matter. How can a philosophy whose great contributions as a philosophy were made at the moment when it was serving the understanding of the Christian Faith become a pure philosophy without losing its proper character?

For the heart of the matter is not whether Thomism should have the ambition to be a modern and living philosophy, intimately involved in the problems of the world today. The heart of the matter is whether Thomism should become modern by losing its roots in theology and its character as a philosophy which was most authentically itself when it was serving the Christian Faith. And this is the heart of the matter because any great philosophy is a life and not a map, a personal inquiry rather than a set of abstractions, a spiritual conquest rather than an elaboration of these abstractions. The historical signature of Thomism in all that is most personal and unique in it as a philosophy is that its greatest metaphysical conquests were made within faith and the understanding of faith. Have we measured the significance of this fact?

This issue does not concern St. Thomas alone. It concerns our age and his possible contribution to it. It concerns our ideal of what Thomism can do in an age which is the battleground between two conceptions of man and his rationality. Shall man become modern by absorbing himself in the mastery of the earth and by building a philosophy which follows in the footsteps of the progress of science? In that case, for man to be rational will be, in the modern sense of the term, to be scientific. Or shall man become modern by undertaking to live today in the higher light of the Christian revelation and by building a philosophy which, at the very moment of giving light to science, is itself nourished and transformed in its very rationality by the light of theology? This issue goes much farther than the mere definition of philosophy or of science. In its nature, philosophy is a fully rational inquiry and in this sense autonomous; but the rationality of philosophy does not say, much less does it guarantee, with what reason or unreason philosophers will philosophize. The issue before us, therefore, concerns our ideal of man, his life, his reason, his education and culture, indeed, his whole temporal existence. Today, man is caught between a God whom he is forgetting and a world of nature of which he is becoming increasingly the master. It is in this situation that we must consider the role and the contribution of Thomism as a philosophy within our society.

No one can doubt that we are in fact living in an age of great scientific achievements. I do not refer merely to the existence of atomic power and to the enormous risks—yes, and even the opportunities—which now confront civilization. Assuredly, scientists have put into our hands weapons of destruction never before known in the history of man. We can certainly pray that such tremendous power will be used for the benefit of mankind—for the alleviation of suffering and want, and for the material and spiritual improvement of the life of mankind. Here, in any case, I am not concerned with our future fate or our present peril. I am rather concerned with the astonishing development of man's reason in the modern world. Man is today a veritable giant of scientific reasoning, of scientific power over matter, of the application of science to many phases of human living, indeed of the conquest of the earth itself. As it has been said, who can doubt that, if we are to be destroyed in an atomic war, this will be an achievement of terrifying rationality, precision, and scientific genius?

On the other hand, it takes no genius to see that the power we have in our hands we sometimes wish we did not have. For, in human affairs, power involves decisions and choices of good and evil, it engages the use of human liberty, and it calls into play deep spiritual forces that are beyond the ability of science to understand, to direct and to control. If man is a giant as a scientist and as a master of nature; if, through his reason, his imagination and his hands, he has made the earth his servant, what will give him a human mastery over his own scientific mastery of matter?

This is not a rhetorical question. For many of our contemporaries, to be modern is to be scientific, to be rational is to follow the methods of inquiry which have led to our conquest of nature, and to be human is to follow science as a sort of religious gospel. This is why metaphysics has been such a scandal to positivist philosophers, whether they stem from Comte or from Mach. Metaphysics is not a science of matter, and positivists believe only in sciences that are wedded to matter; they even dream of unifying all knowledge by reducing it to the status, the meaning and the verifiability of the physical sciences. On this basis, the philosopher would be nothing more than the bookkeeper of the positive sciences, their bookkeeper and their slave.

This, to repeat, is the issue. Those who still retain an awareness of man as a person, as a spiritual creature even in the fact that he is composed of soul and body, must argue that the basic danger of our age is not science in itself nor is it the vast power that science has given us. It is in *our* hands that these are dangers. Our great danger is that we are building a civilization which is less and less human in its life and institutions the more scientific it becomes in its developments. Once more, this is *our* doing. As St. Augustine well knew from his own life, we are what we remember best, and we remember best that in which we are engaged; and we remember it because, by its absorption, dimensions and attachments, our life is made in its image. Today we remember machines, machines of peace or war, but machines; and there is nothing more impersonal than a machine. Over and above the destructive power which threatens us, there is today the danger that we shall lose our memories as men, develop a culture which is efficient and faceless, and bury ourselves insensibly in an earthly paradise of material progress.

If the Christian philosopher—let me even say, the Thomist—is to fulfill his mission in the modern world, then, in the presence of the achievements of physical science, he must help to prevent man from dehumanizing himself by means of his own scientific progress. It is in this direction, as I see it, that the philosopher who is inspired by St. Thomas Aquinas must work. He must work to raise man and his science from the level of matter, to save his reason from absorption in matter, and to free his culture from spiritual sterility and mechanization. He must work to give to modern society a sense of the spiritual meaning of the human reason and of man himself. He must work to educate man in that which is distinctively human within him, namely, not the efficiency of his machines or the skill of his scientific calculations, but his vision of universal truth and his freedom to seek a beatitude beyond time. In an age which is depersonalizing man because science can deal only with things and with facts, the philosopher must work to give a human face to society and to civilization by permeating them with the image of man that is in travail in history.

To this end, Thomism as a philosophy must today retain and renew its roots in theology. Before the days of the manuals, when Thomism lived in the theology of St. Thomas himself, it took the philosophy of Aristotle and so transformed it that many still see no difference between the Aristotle of St. Thomas and St. Thomas himself. And there is no difference, since this Aristotle is the Angelic Doctor's creation. What St. Thomas did to Aristotelian philosophy and science, we must follow in our work today.

But what did St. Thomas do? He made Aristotle speak of God, of man and of the world. But it was of the Christian God that the Aristotle of St. Thomas spoke, the personal and free creator and governor of the world. It was of the Christian man that the same Aristotle spoke. This man was composed of a personal and immortal intellectual soul and a body, and he had a destiny transcending his nature. The ancient Aristotle had never known such a man. And it was of the Christian world that the Thomistic Aristotle spoke, the historical and continually fresh world of creation, and not the eternally old and recurring world of the ancient physics. Furthermore, while St. Thomas was thus making Aristotle a living philosopher in the 13th century, the Averroists, having decided that the historical Philosopher had spoken once for all in the past, embalmed his words for posterity. But a philosophy which speaks only in the past is dead; and the Averroists, proclaiming Aristotle an antique exemplar, followed a dead philosopher. St. Thomas, on the other hand, did not follow Aristotle, he led him. He led him by making Aristotle speak in the living present, within the framework of the Christian world, and in the light of the truth. And the voice of Aristotle thus began to live again as a philosophical voice, yet purer and truer than it had ever been in the pupil of Plato or in the master of the Greek and Arabian commentators.

How St. Thomas accomplished his remarkable revolution is important to us today. He did not do it by repeating Aristotle in order thereby to think philosophically, nor by sealing reason within itself in order to establish philosophy in its proper rationality. He did it by raising the Aristotelian world view to the heights of a spiritual philosophy, uniting the whole creation to the truth of revelation as to its end, and concentrating its maximum philosophical effort at the point of man's entry within faith. How could it be otherwise? To St. Thomas, at least, the very aim of philosophy in its highest part—which is also the highest aim written in man's nature—is to know God. This is the fulfillment of philosophy and of man, and it is this fulfillment which, however secretly, gives substance and purpose to the rationality of man and to his existence. If this be true, then reason and philosophy are not only at home within revelation, they even find in the truth that has descended from God a greater perfection and a fuller awakening of their own ascending movement towards God. To live within faith is thus for philosophy, according to what is highest in its nature, to be at the beginning of its destiny; and to grow under the light of theology is for philosophy to grow according to its proper finality. At least, this is what we are led to think by the character and stature that philosophy received as it lived within the mind—and the life—of St. Thomas Aquinas.

Of all the occupations in which philosophy can be engaged in any age, there is one of which we have a paramount need today. Not all will recognize this need, and some will even deny its existence. Yet this somber fact is but a part of the need itself. We need in our day a philosophy which is engaged in our world in the manner in which the philosophy of St. Thomas was engaged in his. We need a philosophy living within faith, developing and growing within faith, and raising to the light of faith its whole vision of the world. We need a Christian philosophy to act as a light within our society, a philosophy that will lead rather than follow science, a philosophy whose rationality is impelled and sustained by faith to live on the edge of eternity, a philosophy that can create a world of truth in which man may see with spiritual steadiness the meaning of the work of his hands. We need a philosophy that will help us to eternalize our temporal existence, not to lose eternity in time. To be such a Christian philosophy is the mission of Thomism in the 20th century, even as it is the responsibility of the Thomist to contribute to its realization.

THE ROAD AHEAD

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On this 35th Anniversary of the first Armistice Day it seems most appropriate to consider another armistice—an armistice still in the future—I refer to the armistice when atomic arms are finally stacked because of man's ultimate recognition that war has ceased to be a useful way to end international disputes. You who are old enough can recall the joy with which the first Armistice, back in 1918, was hailed. Now consider what gladness there will be in this old world when it becomes clear that we are well on the road to this last atomic armistice. God grant us that day of survival.

You have given me today the most difficult of all tasks—that of looking into the future. I am neither scientist nor philosopher, so, in looking ahead with you, I am going to stray somewhat from the theme of our symposium, "Philosophy and Science in An Age of Power".

Although the future seldom turns out quite as one expects, I think it safe to say, at the outset, that our world for some time to come will be on a walk through a "valley of the shadow of death." The first business of this generation is to see to the survival of science and philosophy, yes even of all of civilization. Unless we all clearly recognize this colossal fact, the Road Ahead, by every human reckoning, will be a very short dead end.

This matter of survival has been especially on my mind since a year ago when I participated in our thermonuclear testing in the far Pacific. From that time on I knew that man's survival must be planned for and worked for and not just lightly taken for granted as in the past. Within a few months after the Eniwetok test in a speech at Manhattan College I tried to put clearly on the public record this fact by stating, "Had you been with me last fall, out in the Pacific at our Testing Station at Eniwetok, you would have no doubt that mankind now has within the range of its grasp means to exterminate the human race." As each atomic test unfolds new and more terrifying secrets, the significance of this April statement becomes clearer and clearer.

The Road Ahead then must be deliberately chosen as a road to survival. Such a national choice is much graver than, say, the choice by a people of a form of government or of an economic system. It is more like the choice by an individual between heaven and hell. I am inclined to believe that in most cases the choice of hell results from a disbelief in its existence. Many of you know how difficult it is in the teaching of religion to get across to modern minds, a full sense of the existence of hell. A same refusal to face the ugly awfulness of all-out atomic warfare is the greatest roadblock in our planning for survival. As I see it, our first national task then is to develop a real awareness of today's alternatives and to recognize the prophetic nature of the statement made in 1920 by H. G. Wells: "Human history becomes more and more a race between education and catastrophe."

So, the first characteristic of the Road Ahead—the first sign post—that I urge you to look for is a clear indication that the road leads to "survival."

I am certain we are not on this road yet. We will have to make some hard, deliberate changes in our present direction in order to get squarely on this road.

I am sure that some of you have heard of a fantastic hair-raising road game called "Chicken" that appeals to the lunatic fringe of America's youth. Two cars are driven toward each other at high speed—the driver who turns away to avoid a crash is "Chicken"—the loser of the game. Well, we are unsuspecting and unwilling players in a global game of "Chicken." Unless the game is called off, we will either pull aside and lose our nation and our freedom or stand on until the inevitable wreck of civilization.

To find an honorable way to end this hellish game of atomic "Chicken" is the most important task ever to face the world. It deserves infinitely more of our energies and attention than has yet been given to it.

What is needed by all is a collective realization such as an individual possesses when faced with sudden death. To postpone the soul's parting company with body a man often finds energy, will, and capabilities he never before suspected that he possessed. If the world can come to realize that this planet, which was once Paradise, may soon become an annex of Hell, it will find tremendous now-hidden reserves to develop nondestructive solutions for the bitter problems that separate the Free World from the Soviet. But let me make clear that the road I am proposing has no pacifism or appeasement signs. It is a road we must travel well armed and willing, as a last resort, to use our arms if forced to defend ourselves. Until the U.S.S.R. makes some changes in its present diabolical course, we must increase our atomic weapons power—but we must also increase immensely the intensity of our interest in and search for peace.

On hearing me suggest that there may be peaceful solutions in the decades ahead for the world's Soviet problems, the more kindly among you may say, "Murray has been so busy with bombs and reactors that he hasn't heard of Malenkov, Vishinsky and Gromyko and brainwashing and a thousand other unmistakable evidences of Soviet implacable hatred for the Free World." I have. But during my early days on the Commission I also heard and from very knowledgeable scientists that it was probably impossible to bring about a thermonuclear explosion—and we did. We did because we were convinced it had to be done if liberty was to survive in this world. A same sure conviction that we must find some kind of a peace if civilization is to survive is the only mental soil I know of in which new approaches to the desperate dilemma we face can possibly take root.

Scientists have known for many years the theory that the fusion of light elements under certain conditions should release large quantities of energy. But there was great doubt as to whether the theory could ever be proven. There was no pressure to develop a device employing such a theory.

We were comfortably ahead of the U.S.S.R. in fission weapons—why chase after a near impossible? Joe I, however, changed all that. Joe I is what we call the Russian test that we detected in 1949. Stung out of our complacency by the unexpected speed of the U.S.S.R. atomic development, our Government cast about for a radical initiative that would restore America's margin of atomic leadership. Our farsighted present Chairman, Lewis L. Strauss, then a Commissioner, proposed what he called a "quantum jump" in our planning for atomic weapons. He proposed that we attempt the nearly impossible—the development of the so-called hydrogen bomb. You know the story of how this remarkable proposal carried the day and how the detonation of a fusion device last November permitted the Free World to save perhaps a small time margin over the Soviet program.

But the years of the atomic age race swiftly by. "Fusion Joe" (to give the recent Soviet test a short-hand name) is now history—ugly unwanted Fusion Joe—proving again that science is universal and that the thermonuclear reaction goes in Soviet Russia as it goes on a Pacific isle.

And now the times cry out urgently for another "quantum jump", but of an altogether different kind. This time a quantum jump not in technology—not in scientific knowledge—but in world politics—that most difficult form of "the art of the possible."

One of the unhealthy aspects of recent years has been a universal absence of a feeling of real hope that peace would at some date in the future ultimately prevail in the world. A certain fatalism has become fashionable in high places—a prideful assuming to know the future and knowing that it is all black. In addition to noting the immorality of such presuming to know the way of God, we should be aware of the opium like deadening effect of this brand of despair.

Certainly we are not warmongers. We don't need to reassure ourselves on this score. But are we really buoyed by any spiritual hope, by any great anticipation which is demanded by the immense difficulties of finding our lost peace? And so I say that our next great task—our next quantum jump—is to enlarge our ideas of what is possible—that is, we must raise our hopes.

The Road Ahead to survival, in this new concept, has Dante's sign reversed to read, "Resume your hope all ye who enter here."

Let me point out to you that there is still some reason for hope. Is it out of all reason to at least speculate on the possibility that two nations which a few years ago combined to fight against Hitlerism could not possibly in time find some common ground on which to stand together against the immeasurably greater menace—the menace of general atomic war? Must we assume that it is absolutely out of the question and beyond all logic that the Marxist, in time, will be moved in his convictions if he can be made fully conscious of the tremendous change that has occurred just during the last year in man's relation to nature?

I have not too much trouble in believing that if this planet were infested with a universal plague or with a hostile force from space, common ground between the U.S. and the U.S.S.R. might be found to permit a common defense of our world. Well, a plague is here, a force is here that can destroy us all. And such inevitable destruction of civilization means death to Sovietism as well as to Democracy.

The United States must get this cold realization first and in the very act of so doing may bring that same realization into the Soviet mind. And this should give the Kremlin cause to reconsider. The promise of Marx was eventual triumph for Communism—not extinction together with Capitalism—in a man-made Abomination of Desolation.

I believe that there is some reason to hope that even in what we have been accustomed to think as the inflexible

Soviet mind—that even in such a mind, atomic determinism will take its place beside its economic brother. Even in the U.S.S.R. Marx eventually should give way to the common sense element in the instinct for self-preservation.

My hopes are nourished too by the evolving progress of the constructive uses of atomic energy. The more valuable for peaceful purposes atomic materials become, the greater will be the sacrifice required for their destruction in nuclear explosions. On this score, the Commission's recently announced decision to construct the first full-scale industrial power reactor marks the first of many necessary giant steps to be taken on the Road Ahead to survival.

Strangely enough, perhaps Fusion Joe, the event which I pray will jolt America into a realization that a weapons advantage alone is no lasting solution for man's greatest dilemma—Fusion Joe may also mark the time when new hope for peace arose in the world. This may be a hope firmly based on the assumption that now that men on both sides of the Iron Curtain know at first hand the supreme danger they will gradually move to avoid it. Hope thus harnessed into extreme efforts to survive should be far more fruitful in the years ahead than the despairing power diplomacy of the past.

But, let me remind you, that the Road Ahead is a toll road. It will take its toll of some of our cherished national illusions, one of which is a belief in the natural superiority of any product, intellectual as well as material, which bears the label "Made In the USA." The road to survival will require immense expenditures of human energy in channels and in ways that we are not used to—and so, at first, will be quite painful. I have in mind the supernatural virtue that will be called upon to be patient for year after year of provocation and Soviet beastlike stalking of its prey. It will take heroic inspired energy to reclimb the heights of disarmament negotiations which we struggled up so uselessly in the late 1940's.

So far, the weight of our defense program, the weight of our fears and anxieties for the future has not been greatly felt. America has prospered immensely since the end of World War II. From a materialistic point of view our country has thrived. That and not government secrecy is why, I believe, it has been so hard to get across to our people an awareness that they are already traveling in the shadow of death. But an America in economic distress might take a different view. Under major economic reversals, pressures to end the arms race might build up—to end it violently if necessary. The event which the U.S.S.R. is so hoping for—economic collapse in the U.S.—might thus be the most dangerous turn in the Road Ahead.

Perhaps the greatest strain on our physical and moral fibre will be to restrain a national impulse to try to get it over with by resorting to that ultimate remedy of a spiritual bankruptcy of mankind—preventive atomic war.

Some of you may have heard of a method of persuasion used in England many centuries ago named "Peine forte et dure." In order to try to force a defendant to plead in a lawsuit weights were put on top of him. Gradually new weights were added until the pressure compelled the tortured man to enter his plea. It is said that in prison one could often hear defendants cry out, "More weight, more weight" as they sought escape from pain by being crushed to death.

Calling upon the weight of atomic bombardment in a preventive war to end once and for all the burden of trying to live in the same world with the Soviets might also end in death—eventual death of civilization as we know it today.

Another toll that we shall have to pay on the Road Ahead is the abandonment of our practice of walking alone.

In the face of the U.S.S.R. rebuff to the unprecedented generosity of America's 1946 Atomic Energy Control proposals, the U. S. has retained almost unlimited exclusiveness and freedom of action in the field of atomic energy and atomic weapons.

To slow down the U.S.S.R. weapons program, we have tried to keep to a minimum the export of classified atomic energy information from this country. There is no doubt that this has been a wise policy. But events in the U.S.S.R., which it was designed to defer or prevent, have occurred and therefore this policy, it seems to me, needs modification. In football when the other team knows your signals, it is senseless to maintain the pretense of their secrecy.

We have failed to preserve safety in exclusiveness. We may yet find safety in some form of international action. As President Eisenhower said in his magnificent speech last April 16th: "We would welcome and enter into the most solemn agreements. These would include. . . . International control of atomic energy to promote its use for peaceful purposes only and to insure the prohibition of atomic weapons."

Now I think that control of atomic weapons would be more attainable if the country again gets used to some companionship on this dangerous atomic road we are walking. A new attempt should be made to try to find a way of working more closely with our original wartime atomic partners—the U. K., Canada, and then with other friendly nations. This would be one step toward demonstrating to the world our belief that atomic energy as the great threat to man's survival is everybody's business.

But it seems to me that much more must be done to make atomic energy and its control everybody's business. The cause of the atomic education needs many and varied pushes in this race against atomic catastrophe.

One difficulty is that words and phrases in this field soon become platitudes and lose significance. The men who speak are not usually the men who have seen and felt and heard the horror of large-scale atomic explosions. Somehow the world must be wrenched out of the toils of rhetoric if disarmament negotiations are to attain reality. Again as our President said last April: "We care nothing for mere rhetoric. We care only for sincerity . . . attested by deeds".

Let me now express a personal thought. It deals with a problem which the Commission has not studied in detail nor reached a position on. To my mind, first-hand experience of mammoth atomic explosions is an essential qualification for future negotiators of the great survival issues in the years ahead. To this end it might be well to consider the resumption, at an appropriate later time, of a policy of more extensive observation of large-scale atomic testing—including foreign observers—as we had some years ago at Bikini. I believe this could again be done under very carefully controlled conditions of observation without loss of security. Under present conditions no weapons technology need be disclosed in clearly demonstrating the unearthly gross effects of really large-scale nuclear explosions.

It seems to me not beyond possibility that if such a step were taken by the U. S., the Soviets might, in deference to world opinion, match it by opening up somewhat their future testing activity—a step that could have incalculable benefit in advancing the search for peace. In our Herculean efforts to make the Soviet see that their interest and ours lies in atomic weapons control, it will undoubtedly be necessary to take unusual measures. That is one of the tolls which is payable on this Road Ahead.

It took a Pearl Harbor to galvanize America into unified action to meet the Japanese threat. I suggest that Fusion Joe, in retrospect, will seem a kind of non-destructive Pearl Harbor, which shook America out of its timeworn habits of wishful thinking—thinking that somehow, sometime, a method of calling off the awful game of atomic "Chicken" would spontaneously appear like consciousness ending a nightmare.

From some far point on the Road Ahead, the world may look back on the 1950's as the years of the big explosions—the man made Krakatoas—which affected the course of events more radically than any physical episode in history since the glacial periods. Just as the receding glaciers permitted life to expand its hold on this planet, so may the ominous rumblings of fusion explosions in the Pacific and Asia have forestalled the return of mankind to the life of the cave dweller.

THE RESPONSIBILITY OF THE SCIENTIST

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"The Responsibility of the Scientist in an Age of Power," the subject assigned to me, can be treated under two headings, namely, the responsibility of the scientist for new ideas brought forward, and the responsibility for practical applications.

We shall first try to get our definitions straight. Using the formulation in the statutes of the Catholic University of America, approved by the Holy See, as to its aim, namely "to search out truth scientifically, to safeguard it and to apply it to the moulding and shaping of both private and public life," and respecting the customary meaning of the word "scientist" as applying to a natural scientist only, we will define as a scientist one who searches out truth in nature systematically and applies it to practical problems.

"Responsibility" has a double meaning, one concerned with the nature of the task and the way with which the task is done, the other with the consequences. On principle, a talk on responsibility, which is a talk on duties, ought to be given by a theologian; however, the authorities of Duquesne University have assigned the talk to a layman, and will have to take the consequences.

We will start out then with the discussion of what is called nowadays, a "pure scientist," or better, somebody concerned with "basic Science", i.e., a person whose task it is to search out truth. When we say truth in this connection we must be careful. A detective who looks for the person who broke into a store also looks for truth, but that is not what we mean here. The scientist does not look for an individual fact as such, but for Truth with a capital T, although each scientist can look only for a fraction of it. The essential difference lies in the fact that the Truth the scientist looks for partakes of the general, that it forms part of understanding the world.

We now ask next, "Why is a scientist a scientist, what are his motives and what is his responsibility in being a scientist?" That the question is asked at all is not only due to self-critiques but also to the circumstance—which some people might find regrettable—that the scientist cannot live on air but needs material support, which at present mostly comes from a non-profit organization like a University or Hospital, or from a governmental source, or from industry. If one asks that question, one gets at present the most varied and often very confused answers. These answers often confuse subjective psychological motives and objective justification. Marxists on the one hand, extreme capitalists on the other, will see the only justification for being a scientist and for supporting a scientist in the material benefits of science.

Many scientists, on the other hand, will justify their activities by saying, "that is what I most like to do." As usual, there is a grain of truth in both extreme statements.

Subjectively and psychologically, one should do that for which one is best gifted by God; only then can one do it well, and the enjoyment is a sign that one is doing the task for which one has been best fitted, and that one is doing it well. But this activity needs in addition the objective justification of being good in itself and must prove its usefulness to mankind to justify support by society. The error in the answer mentioned before lies in the exclusive concentration on the material good. According to St. Thomas, the intellect is the primary faculty of the human soul; it has the inborn, natural drive to acquire as wide an understanding as possible. Accordingly, the search for truth, the extension of understanding, works for the natural perfection of the intellect. From this standpoint, the objective justification for research, as far as the responsibility of the scientist is concerned, and as far as support of the scientist is concerned, lies in the fact that the results of the research, being made known, increase the general understanding of nature and its laws and therefore are a primary contribution to the natural perfection of man.

This brings us to the problem of the responsibility of the scientist for the consequences of his discoveries, not the practical consequences, but the consequences as to mental attitudes or "Weltanschauung." Here again, the situation is not as simple as one might at first believe. Ideally, the procedure in a discovery would seem to be that a scientist should first patiently accumulate a large number of facts "proving" his new theory before he offers it to the world. But psychologically, this is not so in many cases. The arduous work of first class scientific research is mentally most exhausting. You cannot stop at 5 o'clock and forget about it, it haunts you day and night. To pursue this task, you must psychologically have a driving enthusiasm, and this often persuades you that your theory is more certain than it really is, or that it has wider applications than, upon test, it will turn out to have. In addition however, the individual originator of an idea cannot test it all by himself; he must submit it to the rest of the scientific community, for criticism, further testing or improvement. This he cannot do any more by writing five private letters to colleagues—as was possible in the 17th century—but only by publication. So it is inevitable that a new idea will get into the public domain before it is "proven." Scientists by necessity differ in their psychological make-up as do other people, some are more cautious and reserved, others more enthusiastic—a distinction Ostwald has designated as the classical and the romantic temperament. But both differ only in degree as far as the release of a new idea, a new attempt at understanding, is concerned before it is "proven." Now such an idea might profoundly affect the general mental attitude, permanently, if it turns out to be correct, temporarily, if it turns out to be wrong.

This is nothing new. Copernicus affected the whole mental outlook of the Western World, although his theory was published before it was "proven." He was violently attacked for it. We ask the question: Should he not have published his book, but suppressed what he believed to be the truth, for the sake of not disturbing accustomed attitudes? Some will say: Copernicus was right to publish because he turned out to be correct.

But why should so many ideas by scientists be published which turn out to be wrong?

This question attributes to the scentists much greater powers than the scientists attribute to themselves. Science is a human endeavor; no scientist is omniscient; no human endeavor—taken worldwide—which is not directly based on divine revelation or divinely guaranteed infallibility can expect to proceed into unknown country on a straight path, without avoiding trial and error.

We have seen in the first part that the scientist is trying to bring about one of the most important natural perfections of mankind, that of helping intelligence to understand and grasp a wider range of nature. This will necessarily from time to time change the general mental outlook. This is uncomfortable but inevitable, just as the change from childhood to adult stature is. It is often accompanied by stresses and even excesses, just as adolescence is. Some people prefer stability to increasing knowledge of truth, just as some parents are sorry to see their children lose the cuteness of babyhood, but that is the way that God has made the world.

Those who would require that scientists put forth only those ideas which in the long run turn out to be true are either expecting them to be prophets or are intent at stopping science altogether. Nonetheless, this is the point where some responsibility of the scientist in the realm of ideas does come in. If he is convinced that a new idea of his is true he has the duty to publish it even if it is liable to bring about a change in mental outlook. However, the greater the expected change, the greater the care with which he must test and check it before laying it before the world; the more he must use caution and disregard pride of authorship. However, all this is a question of degree and subject to inevitable personality differences.

The counterpart of this lies in the education of the people. This should much more inculcate the old American habit of asking "show me"; far too much is it instead producing a habit of credulity, both toward scientific theory and toward political pronouncements.

We now come to the second part, the responsibility of the scientist for the practical consequences of his action. This problem falls in general again into two groups, namely, the social-economic consequences or more generally peace-time-consequences, and the consequences of warfare.

While in all history the thoughts of philosophers and scientists have had the purely intellectual effects described previously, and while such changes of intellectual climate might have had remote practical consequences in politics, the direct material effects of scientific work are mainly of newer origin. In the Middle Ages and for centuries later, there was a fairly sharp division between the arts and sciences. The former gave the knowledge of how to do things best, the latter the understanding of causes. The knowledge of how to do things best came down through a tradition of experience, not from an understanding of the nature of the process. This is, after all, not surprising since the practical applications usually deal wtih situations so complicated that a very high development of the science is needed to be able to unravel the process and achieve understanding by "causes." I have only to point out the development of the art of medicine into the science of medicine which tries to get at the cause of a disease. (Of course, this historical sketch is oversimplified.)

One of the most interesting—at least to me—features of our present day scientific-technological life is the closeness between basic scientific questions, often of fundamental interest to natural philosophy, and extremely practical applications, not foreseen and impossible to be expected by the originators, which follow in a very short time. In the years 1924-1927, de Broglie, Schroedinger, Born and Jordan and Dirac, introduced a completely new view about the nature of matter, called wave mechanics, which asserted that particles behave under certain circumstances like waves. This was proved experimentally in 1927 by Davisson and Germer. This fundamental knowledge was incorporated within 15 years in an instrument called the electronmicroscope, which today can be bought commercially and is as important to the paint manufacturer as to the medical researcher working on virus diseases.

This change has led not only to direct employment of a large number of scientists in industry, but must also raise the question of the responsibility of scientists working in basic research for the long range practical consequence of their work.

Actually this is only more spectacular, but not different in its nature from the responsibility of other people for long range effects of their activity. A man has a forest and decides to cut the wood. This might denude a ridge and lead, in the long run, to floods in the valley. What is his responsibility? Will or should he be able to predict the consequences and even if he does, how much is he morally bound by them?

Unfortunately, as far as I know, moral theologians and philosophers give very little guidance in that problem except as to general principles. And, how should one treat the case where the change introduced will bring immediately bad effects but will in the long range be beneficial? The theologians do teach a definite doctrine about tolerating an evil side effect—not directly willed—for the sake of a greater good, but how can mortal man, scientist or not, weigh these two against each other for the distant future, without having the gift of prophecy? To be more specific, we might consider Columbus as explorer, a scientist in a more general sense. What is his moral responsibility for the discovery of America? The immediate consequences were that many Indians were baptized, but other effects were extremely bad; whole Indian tribes were annihilated and a disease of a virulence almost like the plague introduced in Europe. The effects 450 years after are before you; a country in which the Church is free and vigorous, a continent which contains one-fifth of the population of the earth, a country which has saved Europe from tyranny and afterwards from starvation. Which of that should Columbus have foreseen, for which part is he responsible?

Or to take a case closer at hand, everybody seems agreed that the direct effects of medical research are beneficial. But the effects of the decrease of infant mortality, of the average increase of the life span after infancy, have also had considerable social and economic and even moral effects, not all of them desirable. What should the medical man do? Should he refrain from trying to keep children alive, since it might promote birth control if three out of three children survive instead of three out of twelve?

Questions like these must be taken into account and properly answered, if we are to make a decision on the responsibility of the scientist for the practical consequences of his work. The best we can, at present, do is to continue working for those applications which are in themselves good, and leave the consequences in the hands of God. Unfortunately some scientists do work directly on applications which they consider good, but which we as Catholics know to be evil in themselves.

However it would be unjust—as is often done—to make the scientist responsible for the remote and indirect consequences of his work. What should be done, and unfortunately is not, is that the theologian on one side, public authority on the other, should be aware of the possible consequences of new scientific and technical developments and take preventive measures to avoid the possible evil side effects before it is too late. Many people have, e. g., warned of the economic effects of an increasing population of oldsters, but nothing has yet been done effectively.

I am now finally coming to the last question, that of scientific work on weapons of war. You will notice in the progress of my talk, that the problems of responsibility have become less and less clear cut, less and less answerable directly, because the situation gets progressively more complex.

The activity of scientists in warfare is only a natural development of the systematic application of scientific results in other practical fields, whether technology, medicine or agriculture.

The problem of responsibility for this activity, has come much more to the front, due to the development of the new weapons. In themselves these weapons are usually not more cruel than those of old; an arrow wound is more painful than a bullet wound, a fire pot or burning arrow has not much different results from a flame thrower, death from an atomic bomb is much less painful than that from boiling oil or molten lead, used in the late Middle Ages in defense of castles.

What is new and frightening in the new weapons is the fact that they do not hit one individual but a whole city, and that their possible after-effects may threaten the survival of mankind.

Should then the scientists work on these weapons at all? Are they morally responsible for the consequences? Do they care? To answer the last question first, many care very much.

One should distinguish here work on the improvement of so-called conventional weapons and the other instruments of war like guns or ships, and work on the new weapons or so-called instruments of mass destruction, like atomic bombs. While on principle the problems are similar, the difference in magnitude restricts most of the public discussion, and we will restrict ours to the latter.

The first point to note is this: If some scientists, for moral reasons, refuse to work in a particular field, e.g. if the U. S. scientists in 1941 had refused to work on the atomic bomb—this might have delayed its development several years but not forever; the technical consequences follow so logically from the basic knowledge, that only universal agreement could prevent the future translation of the basic knowledge into practical reality; the first inventor's refusal to divulge his invention might now delay it a few years—five hundred years ago such a suppression might have resulted in a delay of centuries.

Next one might ask why do scientists work on weapons at all. I will not pretend that the motives are all on the highest level; many are just the ordinary motives of life, great interest in the problems, good pay, comparative security of position. But one should not underestimate the strength of the patriotic motives. Here the scientist is confronted with the probability or certainty that a probable enemy works himself on the terrible weapons. The scientist disapproves of their use, but should he stop working on them, since a chance exists that the enemy will use them? Furthermore, developing an effective defense against the weapon if used by the enemy requires the practical knowledge of what the offense can do, so that even if defense only is intended, the research and development on the possibilities of offensive use will also be required from the scientist. The decision of how the results will be used, is however, usually in other hands. It might be mentioned here in 1945 a group of the scientists working on the atomic bomb wrote, weeks before it was dropped, a memorandum to the President warning of the grave consequences of using the bomb against the enemy. It is not known whether this memorandum ever reached the President.

To this problem of conscience the scientists have reacted in different ways: some have ignored it; a few have gone to the other extreme and have refused any kind of military work; still others have been selective in the kind of military work they accepted; a relatively large group, in despair at finding a way out of the dilemma, have been looking for political ways of abolishing the dilemma, for political ways of making war itself impossible. Of course the scientists do not claim to be experts in politics, but in our form of government every citizen or group of citizens has the right to propose political means to achieve a desirable end. Some of the political means proposed may be naive, since the scientists share with most other citizens the lack of expertness in political means, and only have over the others the advantage of knowing the urgency of the problem.

And now what is, in this problem, the position of the Catholic scientists who should have the guidance of their faith? Quite recently, on October 19, the Holy Father, in an address to military physicians, discussed the problem. He in essence repeated the well known Catholic doctrine, that one cannot directly cooperate with evil. He said: "Research in and the discovery and knowledge of new methods of annihilating the masses by biological and chemical warfare may, as a pure growth of knowledge constitute a positive value. But they do not in the hands of every doctor, of every head of an army or even of every nation. Injustice he can never support even in the service of his own country, and when that type of war constitutes an injustice, the doctor may not take part in it." If I interpret this rightly, this means that the scientist, like everybody else, cannot participate in military preparations for a war which he knows will be unjust; this would be a war undertaken for reasons other than "absolutely necessary self defense of a community." In the case of some governments, one can a priori suspect that a war undertaken by them will be unjust, and then there is no problem. For us, however, a problem does arise; we can confidently expect that our own Government will not start an unjust war; but can we be equally confident that when a just war has started, the Government would not use weapons unjustly? This question might seem shocking, but is justified in view of the pragmatic spirit which has permeated American life, which seems to say everything is permitted if it contributes to victory; after all we prided ourselves on actions which were condemned vigorously twenty-seven years earlier.

According to the Holy Father's pronouncement, then, a scientist may definitely not work on weapons if he knows they will be only unjustly used. Similarly, a Catholic Congressman cannot vote money for the manufacture of a weapon that he knows will be used only unjustly and a Catholic flier cannot drop it.

If some of the users are going to be just, some unjust, then one has to draw a balance to determine whether one may not cooperate. Answers to three questions are then required: What is unjust use? How and to what degrees can and must the scientist try to predict what use will be made of the weapon in the future? And if the use will be mixed, just and unjust, how is the balance to be drawn?

As to the first question, a direct attack aimed primarily at civilians, like the retaliatory use of the atomic bomb against cities, is illegitimate even if that threat is (or was) the only barrier to a Russian attack on Europe, as Winston Churchill believes.

So I must close my discussion with a big question mark, and plead for the help of the theologians to solve it, and for the help of all men of good will, to make the question meaningless with the help of God, by avoiding war and so allow the scientist to devote his efforts to the works of peace.

THE INTEGRATION OF SCIENCE AND PHILOSOPHY

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In the cosmology of Plato, our universe is a stillborn shadow world, deprived of abiding and certain first principles and hence opaque to the efforts of human science. It is a bleak and hostile world, according to Plato, and within it, there is no natural place for man.

As is well known, Aristotle rejected such a vision, even while he still belonged to Plato's Academy. In the opening book of his *Physics*—the first book you will meet in philosophy if you obey his own order of learning—Aristotle argues that nature does own first principles. For the natural world is the moving world. And movement, Aristotle reasoned, implies a subject or a matrix that achieves a modification called a form. Change essentially involves, then, a subject, usually called matter, and a form.

For Aristotle and for those who accept his logic, science includes that knowledge only which is reached by demonstration from principles; and not from any principles whatsoever but from first principles within the order of reality that the science concerns. Aristotle felt that in coming upon a subject and a form as the essential components of all motion, he had pierced to the principles in the physical world that, for the first time, made possible an authentic science about nature. In the first book of the *Physics,* Aristotle likewise finds that the natural, moving world is best proportioned to our knowing powers. Hence the soul of man, no longer a Platonic stranger in a dark and alien shadowland, can claim a natural place within a natural cosmos.

The historical circumstances that prompted the first book of the *Physics* are not without a present-day flavor. In many respects, Plato is among us. In the wake of the quantum and relativity theories of recent physics, it is often argued that there are no absolutes in nature, that the universe is basically irrational, that—beneath the apparent order of the experienced world—nature is a lawless jungle of particles or a formless energy in a purely relative behavior. According to some opinions, the world can be known only by ideal models or constructs which cannot claim a physical existence. It is even argued at times that the universe can be grasped only in terms of a "likely story," like the myth recounted by Plato in the *Timaeus*. Darwinism has favored the view that nature, including man, is a giant battleground of hostile forces where only the fittest can survive. And some philosophers, shades of the platonic demiurge, will accept only what can be experimented, only what can be made, only what can be cudgeled into human power.

Plato and Aristotle fought their battles in fifth century Athens, but Platonism and Aristotelianism have been fighting almost constantly ever since. In resolving the conflicts of his own day, Thomas Aquinas for the first and only time successfully harmonized their insights. The western world had waited the better part of two thousand years for this achievement, and for all we know, it may be as long or longer before its counterpart appears. If a new synthesis of knowledge is meanwhile to be prepared, it will be useful to remember the synthetic principles of Thomas who, in uniting Aristotle and Plato in the thirteenth century, may well provide the pattern for doing it again.

However Platonism is proportioned within the grand contours of St. Thomas' thought taken as a whole, there is no doubt that in the philosophy of nature he was an Aristotelian. He endorsed that first book of Aristotle's *Physics* which determines the principles of motion. Now what is matter and what is form, and how can they help us to the integration of science and philosophy in an age of power?

Time does not permit a retracing of the reasons which led Aristole—and even more forcefully St. Thomas—to principles of matter and form and to their properties. These reasons are found in their own texts which, unless I am gravely mistaken, lead to the conclusions I am daring to present in a very summary and dogmatic-sounding manner.

Matter is the subject of change. In its own self, it is not determined but is open to determination by form. An apple becomes red. A child becomes adult. A star becomes present in a new place. Moreover, there is a primary subject persisting through changes like the burning of wood where the matter owns the form of wood at the beginning of the process and the form of ashes at the end.

Matter is restless. It has an appetite. The fertile matrix of nature, it is always in an evolutionary mood to produce the new and to reach further perfection. Because it has no form of its own, it is homogeneous. Using a Platonic term, St. Thomas called it a chaos. It is the potential or passive principle in changing things.

The closest analogy to matter in the world that is sensibly observed is quantity. In fact, matter differs from potency in the angelic order because matter is a potency for the quantified. Like matter, quantity has a capacity for reception. It resembles matter in being a subject for modification. Quantity, like matter, is plural and to that extent not determined. Quantity is homogeneous. It has an infinity of potency, in this case potency for division. But unlike matter, quantity has no appetite, no final cause. Matter belongs to the realm of the good. Quantity, as such, does not.

Form, on the other hand, is the end of change. It is the novelty which motion brings about in the subject. A determinant of matter, form confers upon its subject a pattern and an order and even an actual existence. Matter rests in form as in an end, and when new and higher forms are acquired, the old forms remain virtually in the composite. To forms are owed the qualities of nature. It is form that makes for differences in kind. Form gives purpose to function. Indeed, forms are imitations of God Himself, and each one reveals a different facet of Divine Beauty and Divine Being.

Such are some conclusions concerning nature and its first principles of matter and form. Torn from the context of the reasons underlying them, they are simply stated without proof to meet the economy of time. To continue with one more proposition out of its context, it can be said, at least in the name of Aristotle and St. Thomas, that to know a physical reality both the matter and the form must be examined.

This is not true for modern science. Modern biology, to take an example, tends to restrict itself more and more to anatomy, where you dissect material structures and finally the chemical compounds out of which the living world is made. The physical sciences tread the same direction. Their interest is to find what things are made of. They split matter into its parts, molecules, atoms, sub-atomic particles. They study nature to the extent that it is controllable by experiment, hence passive and potential. Their latest reports are transcribed into statistics. For physics especially nature is often described as indeterminate, relative, and sometimes as pure energy. Finally, the physical sciences today prefer to study the universe in terms of what is closest to the material or potential principle in nature, namely quantity, and their method requires considering nature to be, like matter, unintelligible as it stands. For the sciences, it is made intelligible by experiment.

If the foregoing summary is correct, then the object of the scientific method belongs to the order of matter or of material causality. This object is not precisely matter as such, because matter, taken simply, has no form, not even that of quantity; but it is within the order of the material cause. For quantity is present in the physical world by reason of matter, in this case primary matter; matter is likewise the seat of potency or controllability. It is the use of mathematics, referring to the quantity in things, and of experimental control, referring to their potencies, that more than anything else stamps the scientific method with its original cast.

Plato, for whom forms existed only in a separated world of models, likewise viewed the physical universe to be but matter invested with quantity, with contrary properties like the great and the small. But to consider the appetite of matter as closed by quantity alone is to shut off the universe into space and time and to ignore those transtemporal references like forms which led Aristotle to a Prime Mover.

St. Thomas did not deny that quantity plays an important role in change. The kind of form that will emerge from matter in a given change requires that the matter be properly disposed. In his view, mathematical objects exist in sensible matter, though not considered by mathematics in their sensible setting; and like Aristotle before him, he affirmed that the natural sciences contain mathematical reality and something superadded. By studying quantified matter, in the view of St. Thomas, something can be learned of the form itself, for which the quantity prepares. Indeed, quantity is the primary disposition of matter in determining which of the many possible forms will emerge from the subject through a given change. The efficient cause, even when producing a substantial change, begins by changing the quantity. Hence, the quantified approach in the order of material causality has a real basis.

But there is something more in nature than matter with its quantified dispositions. That something is form, the end of the matter. As the final cause in change, it provides the reason for everything that precedes it. As the cause of causes, it yields our deepest insight into nature. Valuable as scientific investigation may be, it is powerless to reach the forms of things. It focuses about matter with its quantified material dispositions that prepare, in proximate or remote fashion, for the forms which are their purposes. That is why both philosophy and science, claiming each in its own way a real basis, can never exclude one another, even though they must be arranged in a hierarchy dictated by the objects on which they bear.

Modern science seeks understanding, according to the testimony of the scientists themselves. Science is not a pragmatism, geared to engineering achievement or medical application.

Yet the fact is that engineering and medicine have advanced upon the heels of scientific progress. More can be done with nature today than ever before, because more is known about material causes and about the dispositions of matter which are in the order of material causes. More is known today about the potencies of matter, and hence nature can be better manipulated to human purpose. Hence, though the sciences are not pragmatic by intention, their progress in exploring matter has enhanced man's power to exploit it.

Because the scientific method, despite its vigorous growth and its valuable achievement, fails to reach the reality of form, those who exalt it into a philosophy deny the objective patterns and the genuine orders which form confers. As the end of matter, form spells out the laws of nature, whereby material things seek their ends. In the world of form, there is the natural law which governs man in his quest for perfection. Form holds up the patterns to regulate the use of the new power which science has bestowed upon our century. Without objective form, the power residing in matter has no law for applying it toward the good of man in his earthly state, and if forms are intimations that reveal the Divine, power without form is powerless to lead men to God. In point of historical fact, our whole culture is today imperiled by the power of atomic weapons in a world that for three centuries of both modern philosophy and modern science has tended to deny form, banishing it like Plato to a mental world and turning the objective world into dumb matter and blind quantity.

Matter and quantity do exist, but even more so does form, which is their end. As something infinite in itself, matter even when endowed with quantity cannot function as a principle or a starting point for motion and for knowledge; and without first physical principles or starting points, an authentic science of the physical world is only a dream.

Hence, just as philosophy and science do not exclude each other, so they cannot be integrated by the opposite extreme of making them coordinate and incommunicable. One has a priority over the other. To show this by example, the philosophy of nature is not a deductive science. It is not a system. From matter and form as the essential principles of change, you cannot deduce, say, the existence of carrots or of iron. Once the reality of such things is established by experience, matter and form explain their motions. But they explain only as principles. They approach motion only at a vague and general level. They do not reveal the chemical constitution of the carrot or the atomic structure of iron, and even less do they intimate the existence of subatomic particles. If the general knowledge of philosophy is to be enriched and enlarged, science must fill in the general outlines of the philosophical picture. This is done by searching out the determinations disposing matter to form. Such dispositions are, truly enough, in the order of the material cause, and they are primarily of a quantitative nature. But since they prepare for form, they can help us to know more about it.

It is not being said here that modern science is concerned only with matter or material causes and that philosophy is occupied with form. The philosopher knows matter and form at a general level. It is only a vague knowledge. By scientific investigation, primarily in the region of the material cause, this knowledge is expanded and completed. It is extended into concrete detail. The progress of biochemistry has certainly revealed to man more about himself than he has known in any previous century; but unless the chemistry is projected against the background of matter as the form of the body, it tells us nothing at all about man as man, the unity of soul and matter. In a similar way, the advancing frontiers of chemistry and physics have greatly extended our knowledge of the mineral world. But without reference to matter as related to form, this new knowledge gives no account of pattern and order. Without relation to form, the dispositions of matter are neutral and meaningless. Rather than forcing the mind toward fixed laws in nature and a knowledge of the so-called Divine element in things, matter, viewed in and for itself alone, can present the mind only with a universe of lawless power.

The dispositions of matter are, in a sense, midway between matter and form. They belong to the matter which they determine and to the form which they prepare. Under different aspects then, they belong to science and philosophy, and more than anything else, I think, they will form the terrain where science and philosophy at some distant moment will meet and mingle. Yet the problem is more easy to state than to solve. From the philosophical viewpoint, the character of a material disposition has not been amply treated, and, as far as I know, has not even been discussed in the growing Thomistic bibliography of our day. From the scientific angle, there is the problem of showing the specialist that there is something beyond his own object for which the things he considers prepare. The proposals here being made are not, therefore, intended to formulate a solution to the problem of science and philosophy but only to indicate a twilight zone where much fruitful research might possibly be done on both sides to unite them in principle and in peace.

The integral view of nature here suggested would not involve a simple translation of scientific data into a philosophical framework, as though the propositions of science were in one to one correspondence with reality. Let us take some practical cases to suggest how the philosopher and the scientist can work together. The dissection of a piece of stained tissue certainly belongs to the order of biology. But what that tissue is, unstained and unkilled, in a whole, undisturbed, dynamic organism is philosophical. A mobile being is not the mere sum of its mechanical dispositions. It is form that gives them a new being in reality and a new value for our knowledge. As another instance, atomic physics offers strong evidence that there are atoms and that these atoms are composed of parts. Physics studies these parts in isolation, as far as possible. But how these parts inhabit nature, uncontrolled and unisolated, is a philosophical problem of interpreting experimental results within the whole amplitude of experienced reality. There is evidence that mesons, stable and conservative in the nuclei of atoms, are capable of only an infinitesimal life outside the atoms. Why this difference if particles are the same inside the nucleus as outside of it?

Yet the difficulties here are enormous, and the final solutions on the borderland between science and philosophy will be often uneasy and fragile, more or less probable in character and open to those improvements which constantly advance the insights of the various sciences. In the subatomic world, we have to look across a fog of theory to believe in atoms at all; we are trafficking in matter infinitesimally small; our vision is clouded by the very confusion that is matter itself when we attempt to consider it without form.

But despite these difficulties and the prospects for only probable solutions to what lies buried in the subatomic archives of nature, the project of submitting the data of science to a philosophical appraisal is intrinsically worthwhile and, for our schools and our culture, an indispensable task. Nature is never known without form, and even matter cannot be understood without the form that is its end. And from another angle, even probable knowledge about the ultimates is better than a great deal of certain knowledge about lesser things. Just as seeing a loved one only fleetingly is more desirable than seeing a lot of other people who are not friends.

Today we are celebrating the achievements of the past by looking ahead toward the future. As Duquesne University is opening another chapter in its service to our Church and our country and to our western civilization, there is hardly a more momentous problem to challenge its scholars than the integration of science and philosophy in an age of power. It is a challenge to all who have at heart the good of the mind, the survival of society, and the glory of God.

Without a return to respect for form, our culture is likely to witness the continued spread of current notions that this is an irrational world, unintelligible to man and hostile to his higher purposes. Such a world will be regulated by the power that makes man servile rather than truth which makes him free and strong.

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